



United States
Department of
Agriculture



Natural
Resources
Conservation
Service

In cooperation with
Texas Agricultural
Experiment Station and
Texas State Soil and Water
Conservation Board

Soil Survey of Robertson County, Texas



How To Use This Soil Survey

General Soil Map

The general soil map, which is a color map, shows the survey area divided into groups of associated soils called general soil map units. This map is useful in planning the use and management of large areas.

To find information about your area of interest, locate that area on the map, identify the name of the map unit in the area on the color-coded map legend, then refer to the section **General Soil Map Units** for a general description of the soils in your area.

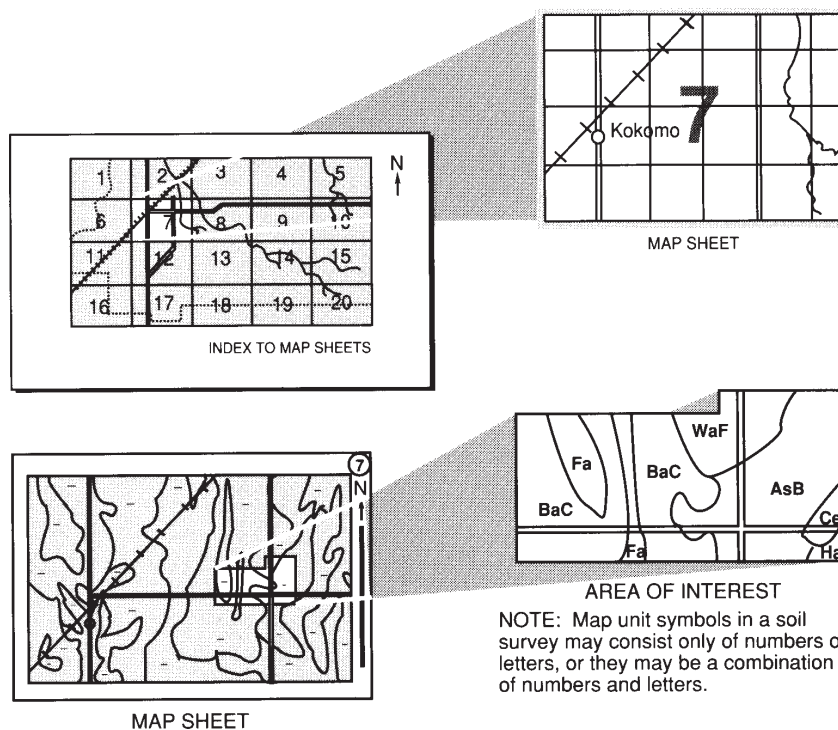
Detailed Soil Maps

The detailed soil maps can be useful in planning the use and management of small areas.

To find information about your area of interest, locate that area on the **Index to Map Sheets**. Note the number of the map sheet and go to that sheet.

Locate your area of interest on the map sheet. Note the map unit symbols that are in that area. Go to the **Contents**, which lists the map units by symbol and name and shows the page where each map unit is described.

The **Contents** shows which table has data on a specific land use for each detailed soil map unit. Also see the **Contents** for sections of this publication that may address your specific needs.



This soil survey is a publication of the National Cooperative Soil Survey, a joint effort of the United States Department of Agriculture and other Federal agencies, State agencies including the Agricultural Experiment Stations, and local agencies. The Natural Resources Conservation Service (formerly the Soil Conservation Service) has leadership for the Federal part of the National Cooperative Soil Survey.

Major fieldwork for this soil survey was completed in 1995. Soil names and descriptions were approved in 1995. Unless otherwise indicated, statements in this publication refer to conditions in the survey area in 1995. This survey was made cooperatively by the Natural Resources Conservation Service, the Texas Agricultural Experiment Station, and the Texas State Soil and Water Conservation Board. The survey is part of the technical assistance furnished to the Robertson County Soil and Water Conservation District.

Soil maps in this survey may be copied without permission. Enlargement of these maps, however, could cause misunderstanding of the detail of mapping. If enlarged, maps do not show the small areas of contrasting soils that could have been shown at a larger scale.

The United States Department of Agriculture (USDA) prohibits discrimination in all its programs and activities on the basis of race, color, national origin, disability, or, where applicable, sex, marital status, familial status, parental status, religion, sexual orientation, genetic information, or political beliefs, as a means of reprisal, or because all or part of an individual's income is derived from any public assistance program. (Not all prohibited bases apply to all programs.) Persons with disabilities who require alternative means for communication of program information (Braille, large print, audiotape, etc.) should contact USDA's TARGET Center at 202-720-2600 (voice and TDD).

To file a complaint of discrimination, write USDA, Director, Office of Civil Rights, 1400 Independence Avenue, SW, Washington, DC 20250-9410 or call 800-795-3272 (voice) or 202-720-6382 (TDD). USDA is an equal opportunity provider and employer.

Cover: Cotton in an area of Ships clay, 0 to 1 percent slopes, rarely flooded. Cotton is a major crop in Robertson County.

Additional information about the Nation's natural resources is available online from the Natural Resources Conservation Service at <http://www.nrcs.usda.gov>.

Contents

Cover	i
How To Use This Soil Survey	iii
Contents	v
Foreword	xiv
Introduction	1
General Nature of the County	2
How This Survey Was Made	5
General Soil Map Units	7
Dominantly Sandy and Loamy Savannah Soils on Uplands	7
1. Silstid-Padina-Robco	7
2. Edge-Crockett	9
3. Hearne-Rosanky-Gasil	10
Dominantly Loamy and Clayey Prairie Soils on Uplands	11
4. Benchley-Luling	12
5. Margie-Crockett	13
Dominantly Sandy, Loamy, and Clayey Soils on Terraces	14
6. Chazos-Dutek-Silawa	15
7. Tabor-Gasil-Rader	16
8. Eufaula-Robco	17
9. Bremond-Wilson	18
10. Bastrop-Burleson	19
Dominantly Loamy and Clayey Soils on Flood Plains	20
11. Ships-Highbank	20
12. Weswood-Yahola-Coarsewood	21
13. Uhland-Sadow-Whitesboro	22
14. Zilaboy-Navasota-Oletha	23
Detailed Soil Map Units	25
AaD—Arenosa fine sand, 1 to 8 percent slopes	26
BaB—Bastrop fine sandy loam, 1 to 3 percent slopes	28
BeB—Benchley clay loam, 1 to 3 percent slopes	29
BeC—Benchley clay loam, 3 to 5 percent slopes	31
BrB—Bremond fine sandy loam, 1 to 3 percent slopes	33
BsA—Bremond-Wilson complex, 0 to 1 percent slopes	34
BuA—Burleson clay, 0 to 1 percent slopes	37
CaA—Cadelake fine sandy loam, 0 to 2 percent slopes	39
ChC—Chazos loamy fine sand, 1 to 5 percent slopes	40
CoA—Coarsewood silt loam, 0 to 1 percent slopes, rarely flooded	42
CoB—Coarsewood silt loam, 1 to 3 percent slopes, rarely flooded	44
CrB—Crockett loam, 1 to 3 percent slopes	46
CrC2—Crockett loam, 2 to 5 percent slopes, eroded	47
DAM—Dam	49
DfC—Desan loamy fine sand, 1 to 5 percent slopes	49
DmB—Dimebox clay, 1 to 3 percent slopes	51
DuB—Dutek loamy fine sand, 1 to 3 percent slopes	53
DuD—Dutek loamy fine sand, 3 to 8 percent slopes	55

EdC—Edge fine sandy loam, 1 to 5 percent slopes	56
EdC2—Edge fine sandy loam, 2 to 5 percent slopes, eroded	59
EdD2—Edge fine sandy loam, 5 to 8 percent slopes, eroded	61
EgD—Edge-Gullied land complex, 3 to 8 percent slopes	63
EuC—Eufaula loamy fine sand, 1 to 5 percent slopes	65
Ga—Gaddy loamy fine sand, 0 to 2 percent slopes, frequently flooded	67
GsB—Gasil loamy fine sand, 1 to 5 percent slopes	69
GsD—Gasil loamy fine sand, 5 to 8 percent slopes	71
HaB—Hammond fine sandy loam, 1 to 3 percent slopes	72
HaE—Hammond fine sandy loam, 5 to 15 percent slopes	74
HeD—Hearne fine sandy loam, 3 to 8 percent slopes	76
HeE—Hearne fine sandy loam, 8 to 20 percent slopes	78
HnD—Hearne fine sandy loam, 1 to 8 percent slopes, graded	79
HnE—Hearne fine sandy loam, 5 to 20 percent slopes, very stony	81
HrD—Hearne gravelly fine sandy loam, 3 to 8 percent slopes	83
HsA—Highbank silty clay loam, 0 to 1 percent slopes, rarely flooded	85
LeC—Lexton clay loam, 3 to 5 percent slopes	87
LeE—Lexton clay loam, 5 to 12 percent slopes	88
LfA—Lufkin loam, 0 to 1 percent slopes	90
LuB—Luling clay, 1 to 3 percent slopes	92
LuC—Luling clay, 3 to 5 percent slopes	94
MgB—Margie fine sandy loam, 1 to 3 percent slopes	96
Na—Navasota clay, 0 to 1 percent slopes, frequently flooded	98
Nd—Navasota clay, 0 to 1 percent slopes, depressional	99
Ot—Oletha clay, 0 to 1 percent slopes, frequently flooded	101
PaC—Padina loamy fine sand, 1 to 5 percent slopes	103
PaE—Padina loamy fine sand, 5 to 15 percent slopes	104
Pt—Pits and Dumps	106
RaA—Rader fine sandy loam, 0 to 2 percent slopes	107
RoB—Robco loamy fine sand, 1 to 3 percent slopes	109
Rr—Roetex clay, 0 to 1 percent slopes, frequently flooded	111
RsC—Rosanky fine sandy loam, 2 to 5 percent slopes	113
RsD—Rosanky fine sandy loam, 5 to 8 percent slopes	114
RvC2—Rosanky fine sandy loam, 3 to 5 percent slopes, eroded	116
Sa—Sandow loam, 0 to 2 percent slopes, frequently flooded	118
ShA—Ships clay, 0 to 1 percent slopes, rarely flooded	120
ShB—Ships clay, 1 to 3 percent slopes, rarely flooded	122
Sk—Ships clay, 0 to 1 percent slopes, frequently flooded	123
SmC—Silawa loamy fine sand, 2 to 5 percent slopes	125
SmD—Silawa loamy fine sand, 5 to 8 percent slopes	127
SnB—Silstid loamy fine sand, 1 to 3 percent slopes	128
SnD—Silstid loamy fine sand, 3 to 8 percent slopes	130
SpB—Spiller fine sandy loam, 1 to 3 percent slopes	132
TaA—Tabor fine sandy loam, 0 to 2 percent slopes	134
Uh—Uhland loam, 0 to 1 percent slopes, frequently flooded	136

W—Water	138
WeA—Weswood silt loam, 0 to 1 percent slopes, rarely flooded	138
WwA—Weswood silty clay loam, 0 to 1 percent slopes, rarely flooded	140
WwB—Weswood silty clay loam, 1 to 3 percent slopes, rarely flooded	142
Wx—Weswood-Yahola complex, 0 to 3 percent slopes, frequently flooded	143
Wy—Whitesboro clay loam, 0 to 1 percent slopes, frequently flooded	145
WzA—Wilson loam, 0 to 1 percent slopes	147
YaA—Yahola fine sandy loam, 0 to 2 percent slopes, rarely flooded	149
Zb—Zilaboy clay, 0 to 1 percent slopes, frequently flooded	151
Use and Management of the Soils	153
Crops and Pasture	153
Rangeland	164
Surface Mine Reclamation	171
Recreation	172
Wildlife Habitat	174
Engineering	177
Building Site Development	178
Sanitary Facilities	179
Construction Materials	180
Water Management	182
Soil Properties	185
Engineering Index Properties	185
Physical Properties	186
Chemical Properties	188
Soil Features	189
Water Features	189
Physical and Chemical Analyses of Selected Soils	190
Classification of the Soils	193
Soil Series and Their Morphology	193
Arenosa Series	194
Bastrop Series	194
Benchley Series	195
Bremond Series	198
Burleson Series	199
Cadelake Series	200
Chazos Series	201
Coarsewood Series	202
Crockett Series	204
Desan Series	205
Dimebox Series	205
Dutek Series	208
Edge Series	209
Eufaula Series	211
Gaddy Series	212
Gasil Series	213

Hammond Series	214
Hearne Series	215
Highbank Series	217
Lexton Series	218
Lufkin Series	219
Luling Series	221
Margie Series	222
Navasota Series	223
Oletha Series	225
Padina Series	226
Rader Series	227
Robco Series	229
Roetex Series	230
Rosanky Series	231
Sandow Series	232
Ships Series	233
Silawa Series	235
Silstid Series	237
Spiller Series	239
Tabor Series	240
Uhland Series	241
Weswood Series	243
Whitesboro Series	245
Wilson Series	245
Yahola Series	247
Zilaboy Series	247
Formation of the Soils	249
Factors of Soil Formation	249
Process of Horizon Differentiation	250
Geology	251
References	255
Glossary	257
Tables	271
Table 1.—Temperature and Precipitation	272
Table 2.—Freeze Dates in Spring and Fall	273
Table 3.—Growing Season	273
Table 4.—Acreage and Proportionate Extent of the Soils	274
Table 5.—Land Capability and Yields per Acre of Crops and Pasture, Part I	276
Table 5.—Land Capability and Yields per Acre of Crops and Pasture, Part II	281
Table 6.—Rangeland Productivity	285
Table 7.—Recreational Development	289
Table 8.—Wildlife Habitat	295
Table 9.—Building Site Development	301
Table 10.—Sanitary Facilities	309
Table 11.—Construction Materials	315

Table 12.—Water Management	321
Table 13.—Engineering Index Properties	329
Table 14.—Physical Properties of the Soils	346
Table 15.—Chemical Properties of the Soils	355
Table 16.—Soil Features	362
Table 17.—Water Features	366
Table 18.—Physical Analyses of Selected Soils	375
Table 19.—Chemical Analyses of Selected Soils	378
Table 20.—Classification of the Soils	381

Issued 2007

Foreword

This soil survey contains information that can be used in land-planning programs in Robertson County. It contains predictions of soil behavior for selected land uses. The survey also highlights limitations and hazards inherent in the soil, improvements needed to overcome the limitations, and the impact of selected land uses on the environment.

This soil survey is designed for many different users. Farmers, ranchers, foresters, and agronomists can use it to evaluate the potential of the soil and the management needed for maximum food and fiber production. Planners, community officials, engineers, developers, builders, and home buyers can use the survey to plan land use, select sites for construction, and identify special practices needed to ensure proper performance. Conservationists, teachers, students, and specialists in recreation, wildlife management, waste disposal, and pollution control can use the survey to help them understand, protect, and enhance the environment.

Various land use regulations of Federal, State, and local governments may impose special restrictions on land use or land treatment. The information in this report is intended to identify soil properties that are used in making various land use or land treatment decisions. Statements made in this report are intended to help the land users identify and reduce the effects of soil limitations that affect various land uses. The landowner or user is responsible for identifying and complying with existing laws and regulations.

Great differences in soil properties can occur within short distances. Some soils are seasonally wet or subject to flooding. Some are shallow to bedrock. Some are too unstable to be used as a foundation for buildings or roads. Clayey or wet soils are poorly suited to use as septic tank absorption fields. A high water table makes a soil poorly suited to basements or underground installations.

These and many other soil properties that affect land use are described in this soil survey. Broad areas of soils are shown on the general soil map. The location of each soil is shown on the detailed soil maps. Each soil in the survey area is described. Information on specific uses is given for each soil. Help in using this publication and additional information are available at the local office of the Natural Resources Conservation Service or Texas Cooperative Extension.

Donald W. Gohmert
State Conservationist
Natural Resources Conservation Service

Soil Survey of Robertson County, Texas

By Harold W. Hyde, Natural Resources Conservation Service

Fieldwork by Harold W. Hyde, Dennis N. Brezina, Maurice R. Jurena, James R. Oakley, Jilane L. Carper, and Wendy A. Greenberg, Natural Resources Conservation Service

United States Department of Agriculture, Natural Resources Conservation Service,
in cooperation with
Texas Agricultural Experiment Station and Texas State Soil and Water
Conservation Board

ROBERTSON COUNTY is in the eastern part of central Texas (fig. 1). The total area of the county, including water areas, is 553,747 acres, or about 865 square miles. The county is about 32 miles long and 28 miles wide. The southern boundary is the historically famous Old San Antonio Road, which was a main route of travel for Spaniards as early as 1690 (6). The western boundary is the Brazos River, and the eastern boundary is the Navasota River. The northern boundary joins Falls and Limestone Counties.

Franklin, located in the central part of the county, has been the county seat since 1880. Other towns and communities include Benchley, Bremond, Calvert, Easterly, Hammond, Hearne, Mumford, New Baden, Owensville, Ridge, and Wheelock.

The land surface is undulating to gently rolling and generally slopes from the central part of the county to the flood plains of the Brazos and Navasota Rivers. Elevations range from 590 feet at the highest point near Bald Prairie to about 240 feet in the southwestern part of the county. In most places, the elevation is 300 to 500 feet above sea level.

The Brazos River and its tributaries, in the western half of the county, provide the major drainage. The Navasota River drains the eastern part of the county.

Robertson County is in two major land resource areas (MLRAs)—the Southern Claypan Area and the Southern Blackland Prairie. The Southern Claypan Area has light-colored, mostly loamy soils that formed under vegetation of a post oak savannah. The Southern Blackland Prairie has dark, loamy soils that formed under grass.

Rangeland is the major land use in Robertson County. Some of the rangeland or unimproved pasture is densely covered with post oak and is used as rangeland or as wildlife habitat. Improved pasture and hayland make up significant areas of the county. About 15 percent of the county is used for cropland, and 1 percent is used for pecan and peach orchards. Urban, miscellaneous, and water areas make up the rest of the county.

This soil survey updates the survey of Robertson County published in 1907 (15). It provides additional information and has larger maps, which show the soils in greater detail.



■ Headquarters of the Texas Agricultural Experiment Station

Figure 1.—Location of Robertson County in Texas.

General Nature of the County

This section gives general information about Robertson County. It describes history and settlement, agriculture, natural resources, and climate.

History and Settlement

In 1837, the Second Congress of Texas organized Robertson County (6). The county was named in honor of Major Sterling C. Robertson, a military leader and Tennessee plantation owner. Major Robertson became an early Texas pioneer when Stephen F. Austin offered colonization grants.

The original county encompassed 25,000 square miles. It included an area between the Brazos and Trinity Rivers, northward from the Old San Antonio Road to the southern boundaries of present-day Jack, Wise, and Denton Counties. When Texas joined the Union in 1846, the boundaries were changed and the county was reduced to its present size.

Native Americans hunted the Brazos Valley for hundreds of years before the arrival of Europeans. Some of the early tribes in this area include the Wichita, Tonkawa, Waco, and Caddo. Invading tribes included the Comanche, Kiowa, and Apache.

From the 1530's through the 1750's, Spanish and French explorers crossed this part of Texas many times. As early as 1705, Frenchmen traded firearms and knives for animal pelts. Texas was a Spanish province for almost three centuries and a Mexican State from 1821 until 1836. Both Spain and Mexico used Texas primarily as a buffer zone, and settlement was very limited. The Austin colonization movement changed the future of Texas forever.

Sterling C. Robertson brought numerous families to Texas, several of which settled in the Brazos Valley. Robertson experienced many challenges. A confrontation with Stephen F. Austin and court hearings with the Mexican government stemmed mainly from Austin's attempt to take over Robertson's grant. Hardships later endured by

Soil Survey of Robertson County, Texas

Robertson's colonists included numerous attacks by Native Americans and battles with Mexican soldiers.

Some of the early settlements in Robertson County include Staggers Point, Dunn's Point, Sterling, Old Franklin, and Wheelock. Staggers Point, near the present site of Benchley, was settled in 1829. It was an active community until it was bypassed by the railroad in the 1860's. Dunn's Fort was a refuge for some residents of Staggers Point during the Indian raids of the 1830's. Sterling, west of Calvert near the Little Brazos River, was the most prominent freight station north of the Old San Antonio Road. Ox-drawn wagons hauled cotton produced in the county to as far away as Mexico.

Old Franklin was the county seat from 1837 to 1850. The town was created as an outpost for land surveyors and rangers. Under hazardous conditions, surveyors marked the boundaries of more than twenty Texas counties. Judge Francis Saulter was mainly responsible for building the town and organizing the new county. Later, he organized one of the first schools. As the county seat, Old Franklin attracted a few storeowners, along with a few farmers and ranchers. During this time, many of the surveyors and some of the settlers were killed in Indian raids. For protection, the county seat was moved to Wheelock. Afterwards, Old Franklin declined in population and the wood-frame buildings deteriorated. The town gradually disappeared and was forgotten by the end of the Civil War.

In the 1840's, Wheelock, a farming and ranching center, became a prominent town. Numerous stores and churches, along with stage, mail, and trade routes, made Wheelock an active community. It was rumored to be a potential site for the University of Texas and, possibly, the State Capitol. In 1850, it became the county seat of Robertson County. This title was short lived, however, and the county seat was moved to the new community of Owensville in 1856.

The loss of the county seat, combined with the building of railroads farther north in the county and the loss of manpower to the Civil War, caused a major decline in Wheelock's population. The Civil War took a toll on Owensville's population, as many residents lost their lives in the war. After the war, much controversy arose in regard to Federal restrictions. Disputes about county government were commonplace. After a railway was extended to Calvert in 1868, Calvert first became a boom town and then the county seat in 1870.

Franklin, selected by vote to be the county seat in December 1879, was constructed in 1880 at the site of a small railroad town called Morgan, near Old Franklin (the first county seat that no longer existed). The site was selected because of its central location and the existing railroad. The name Franklin was chosen because another Texas town was also named Morgan.

Hearne is the largest town in the county with a population of more than 4,500. It was established in 1868, when Mrs. C.C. Hearne deeded 700 acres to the Houston and Texas Central (H&TC) Railroad. This land was surveyed and platted and named in honor of the family of Christopher Columbus Hearne. In its early days, Hearne was a boisterous and rowdy railroad town.

The town of Bremond was started in 1868, and the H&TC Railway reached it in 1869. It was also called Bremond Junction because the railroad separated there; the main line went to Dallas and a spur went to Waco. Many Polish immigrants came to Bremond in the 1870's because of the Russian Revolution of 1863.

Major floods in 1899, 1913, and 1922 had a definite impact on the economy and farming practices in the Brazos River bottom lands. Floods greatly diminished the plantation system in that part of the county because many large landowners claimed bankruptcy. The Italian immigrants in the area started farming on a larger scale. Their descendants became some of the major farmers in the county.

Many rural cemeteries are in Robertson County. Several are large in size and have numerous monuments. Many have historical markers from the State of Texas. Most are near small churches and rural schools. Today, some are in isolated areas that are long

distances from a major town or community. This shows how extensive the settlement of the county was when the first families arrived in the 1820's.

Agriculture

The production of livestock, hay, and crops are the main agricultural enterprises in Robertson County. Crop production was once the primary land use. Today, most of the crop production is limited to the bottomland soils of the Brazos River. On upland soils, pasture and hayland have replaced cultivated crops in most areas.

Most livestock operations in the county are cow-calf operations. The livestock usually are pastured in summer and given hay and feed supplements in winter. The cattle graze small grains, such as oats, rye grass, and winter wheat, in late fall and in winter and spring. Grasses, such as improved bermudagrass and bahiagrass, are grown on pastureland. Sudan hybrids are planted in the spring for hay and forage.

Most of the cropland in the county consists of 90,000 acres of bottom land between the Brazos and Little Brazos Rivers. The major crops are cotton, corn, and grain sorghum. A few areas are planted to soybeans. One large commercial pecan orchard is west of Hearne. A large peach orchard, consisting of about 800 trees, is near the Limestone County line.

Natural Resources

The most important natural resources in Robertson County are soil, water, wildlife, petroleum, natural gas, and lignite coal. Soil is critical for the production of livestock, hay, forage, crops, and orchards, which are the main sources of income in the county. Some ironstone and gravel are mined in the county. Some sand and gravel are mined along flood plains and terraces of the Brazos River. The ironstone, gravel, and sand are used mainly for the construction of roads and buildings.

Water areas are abundant in the county and include numerous small lakes, ponds, creeks, and rivers. The largest areas of water are Lake Limestone, Twin Oaks Reservoir, and Camp Creek Lake, all of which are in the eastern part of the county. Most areas in the county have ample supplies of good-quality underground water for industrial, recreational, agricultural, and domestic uses.

Land leased or sold for mining lignite coal has become increasingly important to the county. The lignite is mainly in the Wilcox geologic material in the northern part of the county and is currently being mined in open pits and burned to generate electricity. The major mining project is between Calvert and Bremond. Most of the oil and natural gas wells are in the northern, north-central, and southern parts of the county and are mainly related to the Wilcox and Cook Mountain geological formations.

Fish and wildlife provide opportunities for recreation and for added income for some landowners. Lake Limestone and Camp Creek Lake are the main areas used for fishing and recreation. Most areas of the county are leased for deer hunting.

Climate

Table 1 gives data on temperature and precipitation for the survey area as recorded at Franklin, Texas, in the period 1971 to 2000. Table 2 shows probable dates of the first freeze in fall and the last freeze in spring. Table 3 provides data on the length of the growing season.

In winter, the average temperature is 51 degrees F and the average daily minimum temperature is 40 degrees. The lowest temperature on record, which occurred at Franklin on December 23, 1989, is -1 degree. In summer, the average temperature is 82 degrees and the average daily maximum temperature is 94 degrees. The highest temperature, which occurred at Franklin on September 4, 2000, is 112 degrees.

Growing degree days are shown in table 1. They are equivalent to “heat units.” During the month, growing degree days accumulate by the amount that the average temperature each day exceeds a base temperature (50 degrees F). The normal monthly accumulation is used to schedule single or successive plantings of a crop between the last freeze in spring and the first freeze in fall.

The average annual total precipitation is 38.70 inches. Of this, 18.92 inches, or about 49 percent, usually falls in April through September. The growing season for most crops falls within this period. The heaviest 1-day rainfall during the period of record was 7.48 inches at Franklin on July 27, 1979. Thunderstorms occur on about 45 days each year, and most occur in May.

The average seasonal snowfall is 0.9 inch. The greatest snow depth at any one time during the period of record was 6 inches, recorded on January 13, 1982. The heaviest 1-day snowfall on record was 5.0 inches, recorded on January 12, 1997. On average, the county does not have on any day at least 1 inch of snow on the ground.

The average relative humidity in mid-afternoon is about 56 percent. Humidity is higher at night, and the average at dawn is about 86 percent. The sun shines 73 percent of the time possible in summer and 50 percent in winter. The prevailing wind is from the south. Average windspeed is highest, 12.6 miles per hour, in April. Thunderstorm days, relative humidity, percent sunshine, and wind information are estimated from the weather station in Waco, Texas.

How This Survey Was Made

This survey was made to provide information about the soils and miscellaneous areas in the survey area. The information includes a description of the soils and miscellaneous areas and their location and a discussion of their suitability, limitations, and management for specified uses. Soil scientists observed the steepness, length, and shape of the slopes; the general pattern of drainage; the kinds of crops and native plants; and the kinds of bedrock. They dug many holes to study the soil profile, which is the sequence of natural layers, or horizons, in a soil. The profile extends from the surface down into the unconsolidated material in which the soil formed. The unconsolidated material is devoid of roots and other living organisms and has not been changed by other biological activity.

The soils and miscellaneous areas in the survey area are in an orderly pattern that is related to the geology, landforms, relief, climate, and natural vegetation of the area. Each kind of soil and miscellaneous area is associated with a particular kind of landform or with a segment of the landform. By observing the soils and miscellaneous areas in the survey area and relating their position to specific segments of the landform, a soil scientist develops a concept or model of how they were formed. Thus, during mapping, this model enables the soil scientist to predict with a considerable degree of accuracy the kind of soil or miscellaneous area at a specific location on the landscape.

Commonly, individual soils on the landscape merge into one another as their characteristics gradually change. To construct an accurate soil map, however, soil scientists must determine the boundaries between the soils. They can observe only a limited number of soil profiles. Nevertheless, these observations, supplemented by an understanding of the soil-vegetation-landscape relationship, are sufficient to verify predictions of the kinds of soil in an area and to determine the boundaries.

Soil scientists recorded the characteristics of the soil profiles that they studied. They noted color, texture, size and shape of soil aggregates, kind and amount of rock fragments, distribution of plant roots, reaction, and other features that enable them to identify soils. After describing the soils in the survey area and determining their properties, the soil scientists assigned the soils to taxonomic classes (units). Taxonomic classes are concepts. Each taxonomic class has a set of soil

characteristics with precisely defined limits. The classes are used as a basis for comparison to classify soils systematically. Soil taxonomy, the system of taxonomic classification used in the United States, is based mainly on the kind and character of soil properties and the arrangement of horizons within the profile. After the soil scientists classified and named the soils in the survey area, they compared the individual soils with similar soils in the same taxonomic class in other areas so that they could confirm data and assemble additional data based on experience and research.

While a soil survey is in progress, samples of some of the soils in the area generally are collected for laboratory analyses and for engineering tests. Soil scientists interpret the data from these analyses and tests as well as the field-observed characteristics and the soil properties to determine the expected behavior of the soils under different uses. Interpretations for all of the soils are field tested through observation of the soils in different uses and under different levels of management. Some interpretations are modified to fit local conditions, and some new interpretations are developed to meet local needs. Data are assembled from other sources, such as research information, production records, and field experience of specialists. For example, data on crop yields under defined levels of management are assembled from farm records and from field or plot experiments on the same kinds of soil.

Predictions about soil behavior are based not only on soil properties but also on such variables as climate and biological activity. Soil conditions are predictable over long periods of time, but they are not predictable from year to year. For example, soil scientists can predict with a fairly high degree of accuracy that a given soil will have a high water table within certain depths in most years, but they cannot predict that a high water table will always be at a specific level in the soil on a specific date.

After soil scientists located and identified the significant natural bodies of soil in the survey area, they drew the boundaries of these bodies on aerial photographs and identified each as a specific map unit. Aerial photographs show trees, buildings, fields, roads, and rivers, all of which help in locating boundaries accurately.

The descriptions, names, and delineations of the soils in this survey area do not fully agree with those of the soils in adjacent survey areas. Differences are the result of a better knowledge of soils, modifications in series concepts, or variations in the intensity of mapping or in the extent of the soils in the survey areas.

General Soil Map Units

The general soil map shows broad areas that have a distinctive pattern of soils, relief, and drainage. Each map unit on the general soil map is a unique natural landscape. Typically, it consists of one or more major soils or miscellaneous areas and some minor soils or miscellaneous areas. It is named for the major soils or miscellaneous areas. The components of one map unit can occur in another but in a different pattern.

The general soil map can be used to compare the suitability of large areas for general land uses. Areas of suitable soils can be identified on the map. Likewise, areas where the soils are not suitable can be identified.

Because of its small scale, the map is not suitable for planning the management of a farm or field or for selecting a site for a road or building or other structure. The soils in any one map unit differ from place to place in slope, depth, drainage, and other characteristics that affect management.

Dominantly Sandy and Loamy Savannah Soils on Uplands

This group of general soil map units makes up about 52 percent of Robertson County. The major soils are Crockett, Edge, Gasil, Hearne, Padina, Robco, Rosanky, and Silstid. These soils developed in sandy and loamy sediments, shale, sandstone, and mudstone. The landscape is very gently sloping to strongly sloping. The soils are moderately well drained or well drained. Permeability ranges from very slow to moderate.

The soils of this group are used mainly as pasture, hayland, or rangeland. Native grasses include bluestems, indiangrass, paspalums, and panicums. Trees include post oak and blackjack oak with an understory of yaupon. The amount and density of woody vegetation varies between the map units. Improved grasses include coastal bermudagrass and bahiagrass. A few areas are planted in watermelons and small grains.

These soils have some limitations affecting most urban uses. The limitations are mainly a high potential for shrinking and swelling, a very slow permeability, low soil strength, and seepage.

1. Silstid-Padina-Robco

Very gently sloping to moderately steep, moderately well drained and well drained, sandy soils that formed in sandy and loamy sediments and interbedded sandstone (fig. 2)

The soils of this map unit are on broad, sandy ridges and divides. The drainage pattern is poorly defined. These deep, loose sandy soils have a high infiltration rate, resulting in very little runoff. Seeps are common along the lower edge of the side slopes. Small drainageways and creeks mainly flow in a southeastward direction to the Navasota River. The underlying material is interbedded sandy, loamy, and clayey

Soil Survey of Robertson County, Texas

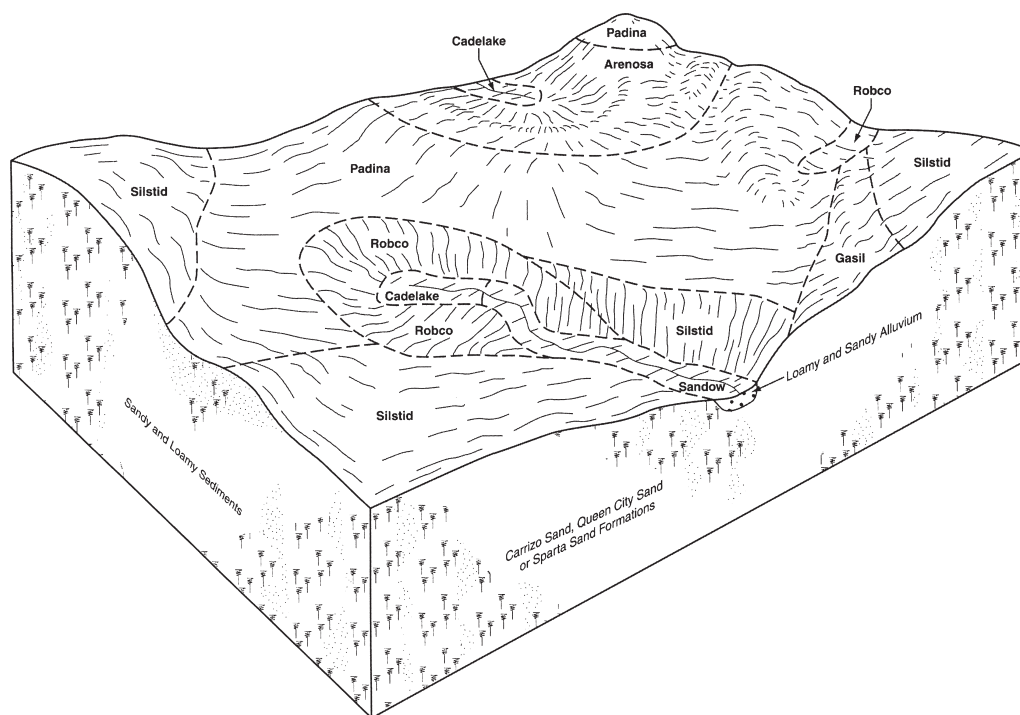


Figure 2.—Pattern of soils and underlying material in the Silstid-Padina-Robco general soil map unit.

sediments. These soils formed mainly in material derived from the Carrizo, Queen City, and Sparta Sand Formations.

This map unit makes up about 26 percent of the county. It is about 29 percent Silstid soils, 25 percent Padina soils, 15 percent Robco soils, and 31 percent soils of minor extent.

Silstid soils are on ridges, divides, and upper side slopes. Typically, the surface and subsurface layers are brownish loamy fine sand and have a combined thickness of about 29 inches. The subsoil, from a depth of about 29 to 63 inches, is brownish yellow sandy clay loam that has reddish and brownish mottles. The subsoil, from a depth of 63 to 80 inches, is mottled red and brownish yellow sandy clay loam. The surface layer is slightly acid, and the subsoil is slightly acid in the upper part and strongly acid in the lower part.

Padina soils are on broad, smooth ridges and side slopes. Typically, the surface and subsurface layers are brownish loamy fine sand and have a combined thickness of about 56 inches. The subsoil, from a depth of about 56 to 80 inches, is grayish with reddish yellow, red, and yellowish brown mottles. It is sandy clay loam in the upper part and fine sandy loam in the lower part. The surface and subsurface layers are neutral or slightly acid, and the subsoil is strongly acid.

Robco soils are on the lower side slopes and at the head of drainageways. Typically, the surface and subsurface layers are brownish loamy fine sand and have a combined thickness of about 29 inches. The subsoil, from a depth of about 29 to 80 inches, is grayish and brownish sandy clay loam, clay, or clay loam that is mottled in dominant shades of gray, red, and brown. These soils are generally moderately acid or slightly acid in the surface layer and subsoil.

Of minor extent in this map unit are Arenosa, Cadelake, Chazos, Dutek, Edge, Gasil, Hearne, Lufkin, Rader, Sandow, Silawa, Tabor, and Uhland soils. Arenosa soils are on broad, smooth divides. Cadelake soils are in poorly defined drainageways.

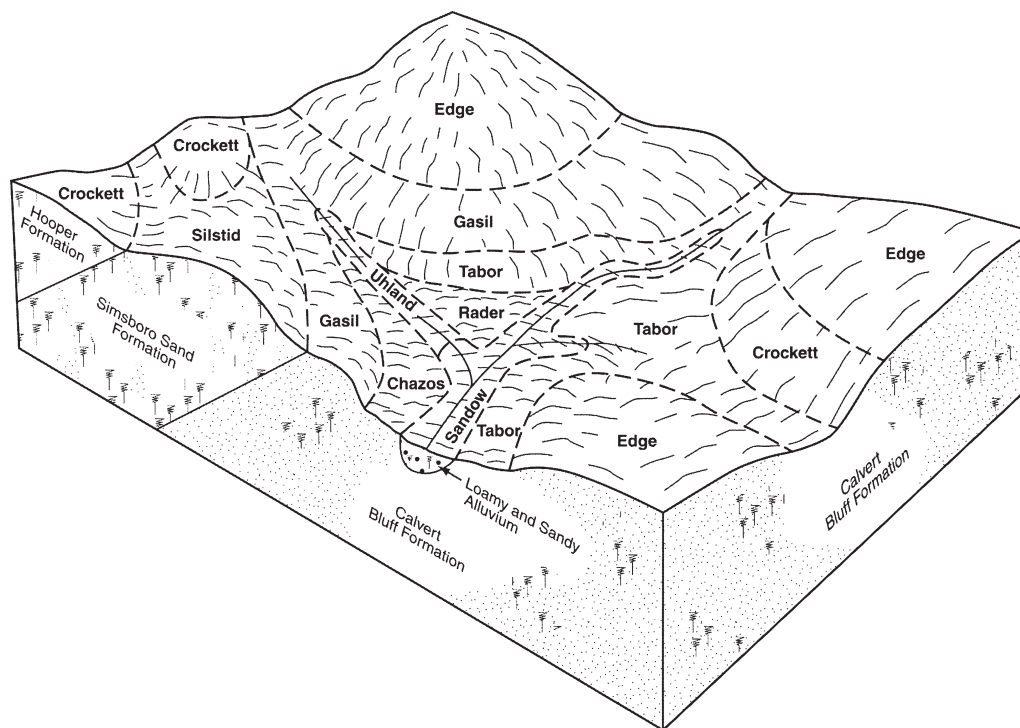


Figure 3.—Pattern of soils and underlying material in the Edge-Crockett general soil map unit.

Chazos, Dutek, and Silawa soils are on terraces above streams. Edge, Gasil, and Hearne soils are on high, convex ridges and side slopes. Lufkin, Rader, and Tabor soils are in nearly level to weakly concave areas on terraces and uplands. Sandow and Uhland soils are on flood plains of creeks and small streams.

The soils of this map unit are used mainly as rangeland. Many areas are planted to pasture and hayland, and a few areas are planted in watermelons. The acreage used for cropland is extremely limited.

Native grasses include bluestem, indianguass, dropseeds, and panicums. Most areas have a canopy of post oak and blackjack oak and a dense understory of yaupon that greatly decreases native plant growth.

Areas of pasture and hayland are planted mainly in improved bermudagrass. Applications of lime and fertilizer are needed to sustain yields.

The major soils have some limitations affecting most urban uses, mainly the sandy surface layer, slope, and seepage. These limitations can be overcome by properly designing and installing building foundations, septic tank absorption fields, and roads and streets.

2. Edge-Crockett

Very gently sloping to moderately sloping, well drained and moderately well drained loamy soils that formed in loamy and clayey sediments and acid and alkaline clays or shales (fig. 3)

The soils of this map unit typically are on broad ridges and side slopes. Several small streams and a few large creeks drain the soils. Some flow southeast into the Navasota River, and others flow southwest toward the Little Brazos River. Much of the rainfall runs off the surface before it can enter these very slowly permeable soils. The

underlying material is stratified siltstone, shale, mudstone, and sandstone of the Wilcox Group.

This map unit makes up about 19 percent of the county. It is about 50 percent Edge soils, 19 percent Crockett soils, and 31 percent soils of minor extent.

Edge soils are on broad ridges, divides, and shoulder slopes. Typically, the surface and subsurface layers are brownish fine sandy loam and have a combined thickness of about 12 inches. The subsoil, from a depth of about 12 to 50 inches, is reddish, yellowish, or grayish clay or clay loam that is mottled with those colors in the lower part. The underlying material, from a depth of about 50 to 80 inches, is weakly cemented brownish and yellowish siltstone and sandstone with strata of yellowish red and gray fine sandy loam in the lower part. These soils are moderately acid in the surface layer and very strongly acid to moderately acid in the subsoil and underlying material.

Crockett soils are mainly on ridgetops or the upper side slopes. Typically, the surface layer is brown loam about 7 inches thick. The subsoil, from a depth of about 7 to 55 inches, is mottled reddish, brownish, and yellowish clay and clay loam. The underlying material, from a depth of about 55 to 80 inches, is light gray shale that has yellowish mottles. These soils are moderately acid in the surface layer and moderately acid to slightly alkaline in the subsoil and underlying material.

Of minor extent in this map unit are Chazos, Dutek, Gasil, Lufkin, Padina, Rader, Robco, Sandow, Silawa, Silstid, Tabor, and Uhland soils. Chazos, Dutek, Silawa, and Tabor soils are on terraces above streams. Gasil soils are on side slopes. Lufkin, Rader, and Robco soils are in nearly level to weakly concave areas on uplands and terraces. Padina and Silstid soils are on ridges and side slopes. Sandow and Uhland soils are on flood plains.

The soils in this map unit are used mainly as pasture, hayland, or rangeland. A few small areas are used as cropland. Some areas are planted in rye, oats, or wheat for winter grazing.

Much of the pasture and hayland supports improved bermudagrass or bahiagrass. Droughtiness is the main limitation in areas used for pasture and hay. Applications of lime and fertilizer are needed for sustained yields.

The areas of rangeland support mid and tall grasses. Areas not properly managed have been invaded by weeds and less palatable grasses. Post oak, elm, and other trees are common in areas of the Edge soils, and they have invaded some areas of the Crockett soils. Mesquite has invaded many fields that are no longer cultivated. Droughtiness is the main limitation affecting rangeland.

A few small fields are periodically planted in corn or small grains. The acreage used as cropland is extremely limited because most cropland in the county is confined to the soils on the flood plains of the Brazos River.

The very slow permeability and high potential for shrinking and swelling limit the use of the major soils for urban development. Properly designed structures can compensate for the shrinking and swelling of the clayey subsoil. Properly designed septic tank absorption fields can help to overcome the restricted permeability. Low soil strength is a limitation affecting local roads and streets.

3. Hearne-Rosanky-Gasil

Very gently sloping to moderately steep, well drained loamy soils that formed in loamy and clayey sediments, sandstone, and shale

Typically, this map unit is on high ridges with long side slopes and broad footslopes. The ridges and side slopes often have exposed sandstone and ironstone that occur as cobbles and boulders on the surface or as rock outcrops. The soils of this map unit are common along the upper slopes of creeks in the central and south-central parts of the

county. They formed in loamy and clayey sediments, sandstone, and shale of the Carrizo Sand, Queen City Sand, Sparta Sand, and Reklaw Formations.

This map unit makes up 7 percent of the county. It is about 35 percent Hearne soils, 21 percent Rosanky soils, 11 percent Gasil soils, and 33 percent soils of minor extent.

Hearne soils are on narrow ridgetops and side slopes. Typically, the surface and subsurface layers are brownish fine sandy loam and have a combined thickness of about 10 inches. The subsoil, from a depth of 10 to 31 inches, is red clay. The underlying material, from a depth of about 31 to 80 inches, is reddish, yellowish, and grayish stratified shale and weakly cemented sandstone. The surface and subsurface layers are strongly acid. The subsoil and underlying material are extremely acid.

Rosanky soils are on broad ridges and side slopes. Typically, the surface layer is yellowish brown fine sandy loam about 7 inches thick. The subsoil, from a depth of about 7 to 47 inches, is red clay in the upper part and red clay loam that has brownish yellow mottles in the lower part. The underlying material, from a depth of about 47 to 80 inches, is stratified reddish, grayish, and yellowish weakly cemented sandstone, clay loam, and sandy clay loam. These soils are strongly acid throughout.

Gasil soils are on the lower side slopes and footslopes. Typically, the surface and subsurface layers are brownish loamy fine sand and have a combined thickness of about 15 inches. The subsoil, from a depth of about 15 to 74 inches, is brownish and yellowish sandy clay loam that is mottled in shades of brown, red, and gray in the lower part. From a depth of 74 to 80 inches, the subsoil is brownish yellow fine sandy loam that has red and light brownish gray mottles. The soils are moderately acid in the surface layer and moderately acid or strongly acid in the subsoil.

Of minor extent in this map unit are Dutek, Eufaula, Lexton, Lufkin, Padina, Rader, Robco, Sandow, Silawa, Silstid, Tabor, and Uhland soils. Dutek, Eufaula, Silawa, and Tabor soils are on terraces above streams. Lufkin, Rader, and Robco soils are in weakly concave areas on uplands and terraces. Lexton soils are on side slopes. Padina and Silstid soils are on broad, smooth ridges and side slopes. Sandow and Uhland soils are on flood plains.

The soils of this map unit are used mainly as rangeland, pasture, or hayland. These soils generally are not used as cropland except for small grains. The gravelly and stony Hearne soils are often selected as excavation sites for road-building materials.

Rangeland vegetation includes tall grasses in an oak savannah. The strongly sloping to moderately steep areas or gravelly or stony areas are used as rangeland.

Most areas of pasture and hayland are established in improved bermudagrass or bahiagrass. Applications of lime and fertilizer are needed for sustained yields.

Limitations affecting urban development include the slope, stoniness, potential for shrinking and swelling, and restricted permeability. These limitations can be overcome by properly designing and installing building foundations, septic tank absorption fields, roads, and streets.

Dominantly Loamy and Clayey Prairie Soils on Uplands

This group of general soil map units makes up about 5 percent of Robertson County. The major soils are Benchley, Crockett, Luling, and Margie soils. Most of these soils have a loamy surface layer and a clayey subsoil. Luling soils are clayey throughout. The soils developed mostly in shale and weathered glauconitic material of the Claiborne Geological Group, which consists of the Cook Mountain and Weches Formations. They are very gently sloping or gently sloping. These soils are moderately well drained or well drained. Permeability is moderately slow to very slow.

The soils in this group are used mainly as pasture, hayland, or rangeland. Some areas are used as cropland. Pasture grasses include improved bermudagrass, bahiagrass, and kleingrass. Native grasses are bluestem, indiagrass, paspalum, sideoats grama, and Texas wintergrass. Trees are dominantly scattered elm, oak, and

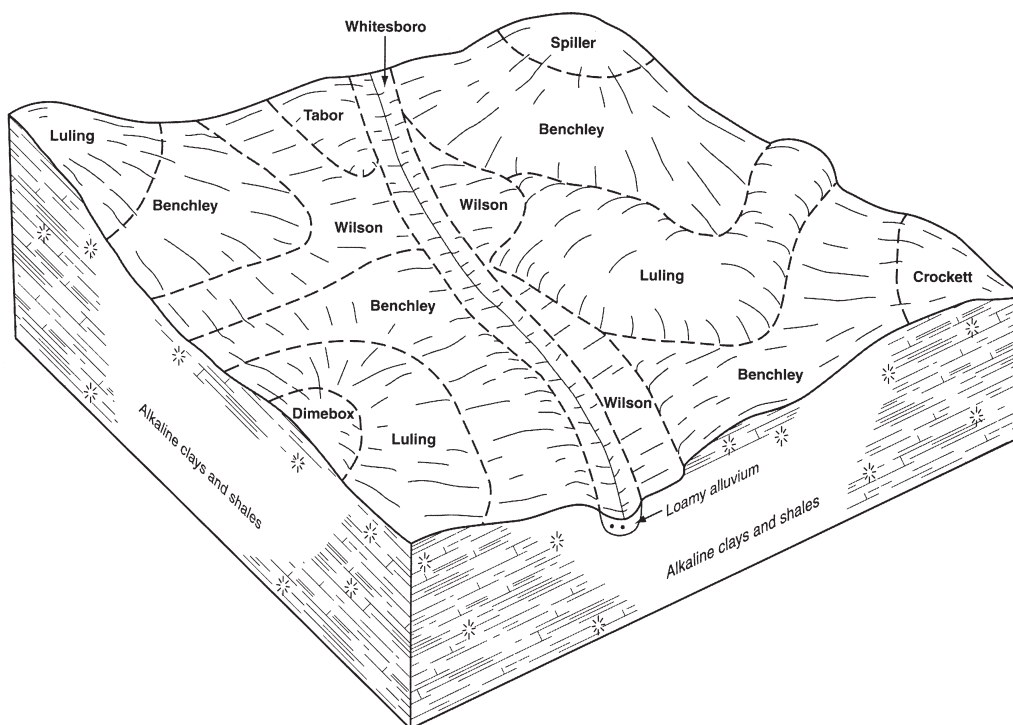


Figure 4.—Pattern of soils and underlying material in the Benchley-Luling general soil map unit.

hackberry. The main crops are small grains. When used for crops, these soils need proper conservation practices, such as contour farming, terraces, or minimum tillage, in order to reduce the hazard of water erosion.

These soils have some limitations affecting sites for most urban uses. These limitations are mainly a high or very high potential for shrinking and swelling, very slow permeability, and low soil strength. The limitations can be overcome by properly designing and installing building foundations, septic tank absorption fields, and roads and streets.

4. Benchley-Luling

Very gently sloping or gently sloping, moderately well drained and well drained, loamy and clayey soils that formed in loamy and clayey alkaline marine sediments (fig. 4)

The soils of this map unit are on the lower side slopes and broad convex ridges. Slopes range from 1 to 5 percent. This map unit is drained by Campbell's Creek, which flows west to the Brazos River flood plain. Cedar Creek and many smaller creeks dissect this map unit and flow into Brazos County. Most of these eventually drain into the Navasota River flood plain. The underlying material of these soils consists of shale that has thin strata of sandstone. These sediments are mainly of the Wheelock Member of the Cook Mountain Formation.

This map unit makes up about 4 percent of the county. It is about 42 percent Benchley soils, 26 percent Luling soils, and 32 percent soils of minor extent.

Benchley soils are on very gently sloping or gently sloping lower side slopes along drainageways. Typically, the surface layer is very dark grayish brown clay loam about 13 inches thick. The upper part of the subsoil, from a depth of about 13 to 20 inches, is very dark grayish brown clay loam that has red and yellowish brown mottles. The lower

part, from a depth of about 20 to 64 inches, is reddish, yellowish, and brownish clay. The underlying material, from a depth of about 64 to 80 inches, is stratified light gray shale and yellowish red sandy clay. These soils are slightly acid in the surface layer, moderately acid in the upper part of the subsoil, and neutral in the lower part of the subsoil and in the underlying layer.

Luling soils are on very gently sloping or gently sloping, broad convex ridges and side slopes. Typically, the soils are clayey throughout. The surface layer is grayish brown and about 13 inches thick. The subsoil, from a depth of about 13 to 64 inches, is brownish with thin strata of weathered shale in the lower part. The underlying material, from a depth of about 64 to 80 inches, is light yellowish brown weathered shale. These soils are neutral in the surface layer and in the upper part of the subsoil and slightly alkaline in the lower part of the subsoil and in the underlying material.

Of minor extent in this map unit are Crockett, Dimebox, Gasil, Sandow, Spiller, Tabor, Whitesboro, and Wilson soils. Crockett soils are on broad ridgetops and side slopes. Dimebox soils are on broad smooth ridges. Gasil and Spiller soils are on slightly higher convex ridges of adjacent geologic formations. Sandow and Whitesboro soils are on flood plains of small streams. Tabor soils are on terraces above streams. Wilson soils are on nearly level flats.

The soils of this map unit are used mainly as pasture and hayland. They are used as rangeland in some areas. They have limited use as cropland.

Most of the pasture and hayland is improved bermudagrass. A few areas are planted to kleingrass. Applications of fertilizer are needed to sustain yields.

Areas of rangeland in climax vegetation are small and scattered. Bluestem, indiagrass, and paspalum are the main native plants. Hackberry and elm are the main trees. Some overgrazed areas have been invaded by mesquite. Overgrazing by livestock increases the growth of undesirable plants and increases the hazard of water erosion in sloping areas.

Small grains are the main crops. Conservation practices, such as contour farming, terraces, and conservation tillage, are needed to prevent water erosion.

The major soils have several limitations affecting most urban uses. The high potential for shrinking and swelling, very slow permeability, and low soil strength can be overcome by properly designing and installing building foundations, septic tank absorption fields, and roads and streets.

5. Margie-Crockett

Very gently sloping or gently sloping, well drained and moderately well drained, loamy soils that formed in loamy and clayey sediments and interbedded sands, clays, and weathered glauconite materials

The soils of this map unit are in small areas of the Weches Formation that outcrop to a limited extent in the south-central part of the county. The landscape typically consists of small, smooth ridges. A few small creeks and drainageways drain the soils. The underlying material includes glauconitic greensand that is interbedded with thin strata of clay and shale. Large stones having numerous fossils have been unearthed in pipeline excavations.

This map unit makes up slightly less than 1 percent of the county. It is about 47 percent Margie soils, 25 percent Crockett soils, and 28 percent soils of minor extent.

Margie soils are on very gently sloping ridges and side slopes. Typically, the surface layer is strong brown fine sandy loam about 6 inches thick. The subsoil, from a depth of 6 to 10 inches, is yellowish red sandy clay loam. From a depth of 10 to 28 inches, it is red clay loam. From a depth of 28 to 66 inches, it is yellowish red clay with red mottles. From a depth of 66 to 72 inches, it is yellowish brown clay loam that has

yellowish and brownish mottles. The underlying material, from a depth of about 72 to 80 inches, is stratified weakly cemented sandstone and weathered glauconite and shale. The surface layer is moderately acid, and the subsoil is slightly acid. The underlying material is neutral.

Crockett soils are on very gently sloping or gently sloping broad ridgetops and side slopes. Typically, the surface layer is brown loam about 7 inches thick. The subsoil, from a depth of about 7 to 48 inches, is mottled reddish, brownish, and yellowish clay. The subsoil, from a depth of 48 to 55 inches, is mottled yellowish and brownish clay loam. The underlying material, from a depth of about 55 to 80 inches, is light gray shale that has yellowish mottles. These soils are moderately acid in the surface layer, moderately acid to slightly alkaline in the subsoil, and slightly alkaline in the underlying material.

Of minor extent in this map unit are Gasil, Lufkin, and Wilson soils. Gasil soils are on gently sloping ridges and side slopes. Lufkin and Wilson soils are on nearly level, concave areas, mainly along small drainageways.

The soils of this map unit are used mainly as pasture and hayland. They are used as rangeland in some areas. The acreage used as cropland is extremely limited.

Most of the pasture and hayland is improved bermudagrass. A few areas are planted in kleingrass. Applications of fertilizer are needed to sustain yields.

Areas of rangeland in climax vegetation are small and scattered. Bluestem, indiangrass, and paspalum are the main native plants. Hackberry and elm are the main trees. Some areas have been overgrazed and invaded by mesquite. Overgrazing by livestock increases the growth of undesirable species and increases the hazard of water erosion in sloping areas.

Small grains are the main crops. Conservation practices, such as contour farming, terraces, and conservation tillage, are needed to prevent water erosion.

The major soils have several limitations affecting most urban uses. The high potential for shrinking and swelling, very slow permeability, and low soil strength can be overcome by properly designing and installing building foundations, septic tank absorption fields, and roads and streets.

Dominantly Sandy, Loamy, and Clayey Soils on Terraces

This group of general soil map units makes up about 25 percent of Robertson County. The major soils are Bastrop, Bremond, Burleson, Chazos, Dutek, Eufaula, Gasil, Rader, Robco, Silawa, Tabor, and Wilson. These soils developed in sandy, loamy, and clayey alluvium of Holocene or Pleistocene age.

These soils are in broad, nearly level to moderately sloping areas on various levels of stream terraces near the Brazos, Little Brazos, and Navasota Rivers. They are also on terraces along many large creeks and adjacent tributaries. Some areas are remnants of terraces in the uplands and are not associated with present-day streams in the county. These soils are moderately well drained to excessively well drained and are slowly permeable to rapidly permeable.

The soils in this group are used mainly as pasture and hayland. Improved bermudagrass and bahiagrass are the main pasture plants. Some areas are in rangeland. The main native plants are bluestems, indiangrass, paspalums, and panicums along with areas of scattered post oak and yaupon. Some areas are used as cropland and planted mainly in small grains.

These soils have some limitations affecting most urban uses. These limitations include a very high or high potential for shrinking and swelling, very slow permeability, and low soil strength. The limitations can be overcome by properly designing and installing building foundations, septic tank absorption fields, and roads and streets.

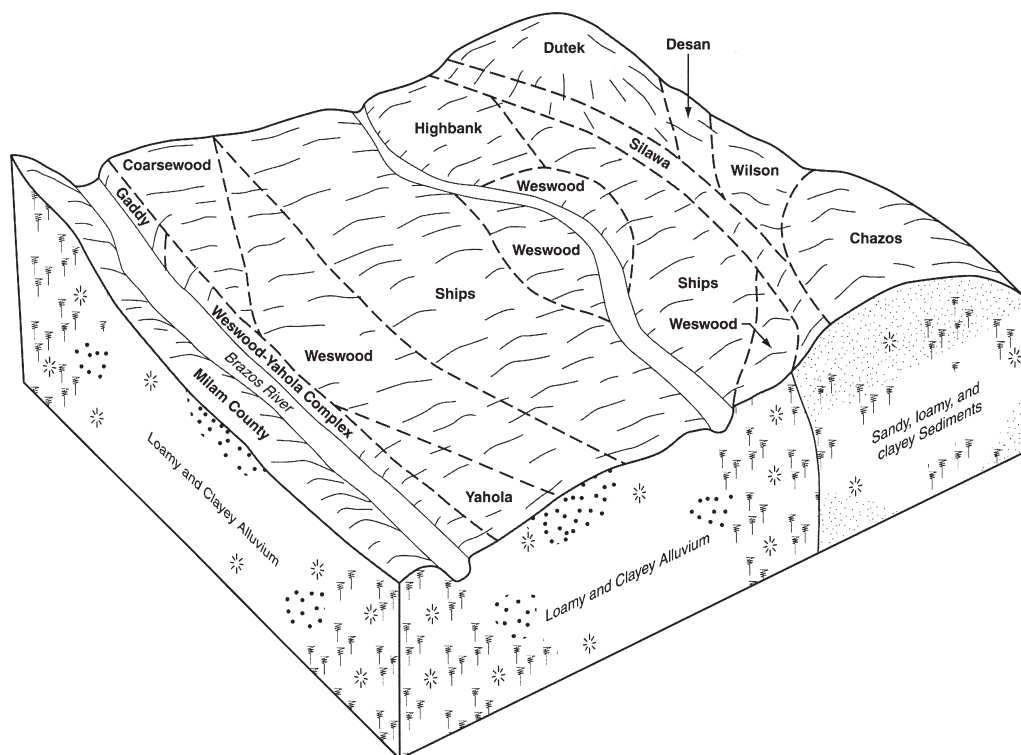


Figure 5.—Pattern of soils and underlying material on the flood plain along the Brazos and Little Brazos Rivers and on adjacent terraces. Included are the Chazos-Dutek-Silawa, Ships-Highbank, and Weswood-Yahola-Coarsewood general soil map units.

6. Chazos-Dutek-Silawa

Very gently sloping to moderately sloping, moderately well drained and well drained soils that formed in sandy, loamy, and clayey fluvial terrace sediments (fig. 5)

The soils of this map unit typically are on stream terraces. Slopes range from 1 to 8 percent. The soils are on convex, sandy ridges and side slopes adjacent to flood plains of the Brazos and Navasota Rivers and many creeks and streams. The underlying material is loamy and sandy sediments.

This map unit makes up about 12 percent of the county. It is about 23 percent Chazos soils, 22 percent Dutek soils, 20 percent Silawa soils, and 35 percent soils of minor extent.

Chazos soils are on convex sandy ridges. Typically, the surface and subsurface layers are brownish loamy fine sand and have a combined thickness of about 14 inches. The subsoil, from a depth of about 14 to 22 inches, is strong brown clay that has red and pale brown mottles. From a depth of 22 to 35 inches, it is pale brown clay loam that has reddish and light brownish gray mottles. From a depth of 35 to 80 inches, it is brownish and yellowish sandy clay loam that has reddish, brownish, and grayish mottles. These soils are slightly acid in the surface and subsurface layers and moderately acid in the subsoil.

Dutek soils are on very gently sloping to moderately sloping convex ridges and side slopes. Typically, the surface and subsurface layers are brownish loamy fine sand and have a combined thickness of about 27 inches. The subsoil, from a depth of about 27 to 58 inches, is reddish sandy clay loam. The underlying material, from a depth of about 58 to 80 inches, is reddish yellow fine sandy loam. The surface and subsurface

layers are slightly acid or moderately acid. The subsoil and underlying material are moderately acid.

Silawa soils are on very gently sloping to moderately sloping convex ridges and side slopes. Typically, the surface and subsurface layers are brownish loamy fine sand and have a combined thickness of about 15 inches. The subsoil, from a depth of about 15 to 57 inches, is red sandy clay loam that has strong brown mottles. The underlying material, from a depth of about 57 to 80 inches, is red fine sandy loam. These soils are moderately acid or strongly acid in the surface and subsurface layers and very strongly acid in the subsoil and underlying material.

Of minor extent in this map unit are Desan, Edge, Eufaula, Hearne, Lufkin, Padina, Rosanky, Sandow, Uhland, Whitesboro, and Wilson soils. Desan soils are on ridges and side slopes. Edge, Hearne, Padina, and Rosanky soils are on high ridges and footslopes on uplands. Eufaula soils are on terraces along streams. Lufkin soils are in nearly level concave areas on uplands. Sandow, Uhland, and Whitesboro soils are on flood plains of creeks and small streams. Wilson soils are in broad, smooth areas on terraces.

The soils of this map unit are used mainly as pasture and hayland. Some areas are used as rangeland. A few areas are used as cropland.

Most of the pasture and hayland is planted in improved bermudagrass and bahiagrass. Applications of lime and fertilizer are needed to sustain yields.

The main native plants are bluestems, indiangrass, and paspalums. Some areas have post oak and blackjack oak with a yaupon understory. Overgrazing by livestock increases the growth of undesirable plants and increases the hazard of water erosion.

Corn, watermelons, and small grains are grown in some areas. Applications of fertilizer and lime are necessary for optimum yields.

The major soils have some limitations affecting most urban uses. These limitations include droughtiness, a moderate potential for shrinking and swelling, slow permeability, and low soil strength. These limitations can be overcome by properly designing and installing building foundations, septic tank absorption fields, and roads and streets.

7. Tabor-Gasil-Rader

Nearly level to moderately sloping, moderately well drained and well drained soils that formed in acid and alkaline loamy and clayey fluvial sediments on terraces and terrace remnants associated with uplands

The soils of this map unit are on stream terraces and on Pleistocene-age terraces on uplands. These soils are in broad, smooth areas and on convex ridges and side slopes. Slopes range from 0 to 8 percent. The underlying material is loamy and clayey sediments.

This map unit makes up about 8 percent of the county. It is about 27 percent Tabor soils, 25 percent Gasil soils, 20 percent Rader soils, and 28 percent soils of minor extent.

Tabor soils are in nearly level, broad, smooth areas. Typically, the surface and subsurface layers are brownish fine sandy loam. They have a combined thickness of about 17 inches. The subsoil, from a depth of about 17 to 58 inches, is brownish and grayish clay that has reddish, brownish, and yellowish mottles. From a depth of about 58 to 80 inches, it is light gray clay loam that has strong brown mottles. The surface and subsurface layers are slightly acid. The subsoil is strongly acid in the upper part and slightly alkaline in the lower part.

Gasil soils are on convex ridges and side slopes. Typically, the surface and subsurface layers are brownish loamy fine sand and have a combined thickness of about 15 inches. The subsoil, from a depth of about 15 to 54 inches, is brownish and

yellowish sandy clay loam that has reddish and brownish mottles. From a depth of about 54 to 74 inches, it is mottled yellowish brown, red, and light gray sandy clay loam. From a depth of about 74 to 80 inches, it is brownish yellow fine sandy loam that has red and light brownish gray mottles. The surface and subsurface layers are moderately acid. The subsoil is strongly acid in the upper part and moderately acid in the lower part.

Rader soils are in nearly level, broad, smooth areas. Typically, the surface and subsurface layers are fine sandy loam that is yellowish brown in the upper part and very pale brown in the lower part. They have a combined thickness of about 21 inches. The subsoil, from a depth of about 21 to 24 inches, is light yellowish brown loam that has brownish yellow and reddish yellow mottles. From a depth of about 24 to 49 inches, it is light brownish gray clay loam that has reddish yellow and red mottles. From a depth of 49 to 65 inches, it is mottled gray, brownish yellow, and red clay. From a depth of about 65 to 80 inches, it is gray clay that has yellowish red mottles. These soils are slightly acid in the surface and subsurface layers and in the upper part of the subsoil. They are moderately alkaline in the lower part of the subsoil and in the underlying layer.

Of minor extent in this map unit are Edge, Hearne, Lufkin, Rosanky, Sandow, Uhland, and Wilson soils. Edge, Hearne, and Rosanky soils are on convex ridges and side slopes on adjacent uplands. Lufkin soils are in nearly level to weakly concave areas. Wilson soils are in nearly level to weakly concave areas on terraces. Sandow and Uhland soils are on flood plains.

The soils of this map unit are used mainly as pasture and hayland. Some areas are used as rangeland. A few areas are used as cropland.

In most areas, pasture and hayland are planted in improved bermudagrass and bahiagrass. Applications of lime and fertilizer are needed for sustained yields.

The main native plants are bluestems, indiagrass, and paspalums. Post oak and blackjack oak are the main trees, and the understory is yaupon. Overgrazing by livestock increases the growth of undesirable plants and increases the hazard of water erosion.

Corn and small grains are grown in some areas. Fertilizer and lime are necessary for optimum yields.

The major soils have some limitations affecting most urban uses. These limitations include a high potential for shrinking and swelling, very slow permeability, and low soil strength. The limitations can be overcome by properly designing and installing building foundations, septic tank absorption fields, and roads and streets.

8. Eufaula-Robco

Very gently sloping and gently sloping, somewhat excessively drained to moderately well drained, sandy soils that formed in sandy and loamy fluvial terrace sediments, remnants of terraces, and loamy sediments adjacent to drainageways

The soils of this map unit are on broad, sandy ridges and divides. The soils mainly formed in terrace sediments, but in places the drainage pattern is poorly defined. These deep, loose sandy soils have a high infiltration rate, resulting in very little runoff. Seeps are common along the lower edge of the side slopes. The underlying material is interbedded sandy, loamy, and clayey sediments. The soils are dominantly along streams and on high ancient terraces associated with uplands of the Carrizo, Queen City, and Sparta Sand Formations.

This map unit makes up about 3 percent of the county. It is about 60 percent Eufaula soils, 14 percent Robco soils, and 26 percent soils of minor extent.

Eufaula soils are in gently sloping, broad areas and on side slopes. The surface and subsurface layers are brown and pale brown loamy fine sand and have a combined

thickness of about 31 inches. The subsoil, from a depth of about 31 to 80 inches, is very pale brown loamy fine sand with lamellae of strong brown fine sandy loam. The surface and subsurface layers are moderately acid, and the subsoil is strongly acid.

Robco soils are sandy soils on very gently sloping lower side slopes and in nearly level areas along small creeks and drains. Typically, the surface and subsurface layers are brownish loamy fine sand and have a combined thickness of about 29 inches. The subsoil, from a depth of about 29 to 40 inches, is brownish and grayish sandy clay loam that has yellowish brown mottles in the lower part. From a depth of about 40 to 54 inches, it is light yellowish brown clay that has yellowish brown and gray mottles. From a depth of about 54 to 80 inches, it is light gray clay loam that has yellowish and brownish mottles. These soils are moderately acid or slightly acid throughout.

Of minor extent in this map unit are Arenosa, Hearne, and Uhland soils. Arenosa soils are on broad, smooth divides. Hearne soils are on convex ridges and side slopes. Uhland soils are on flood plains.

The soils of this map unit are used mainly as rangeland. A few areas are planted to pasture and hayland, and a few areas are planted in watermelons. The acreage used as cropland is limited.

Native grasses include bluestem, indianguass, dropseeds, and panicums. Most areas have a post oak and blackjack oak canopy and a dense yaupon understory, which greatly decreases native plant growth.

Areas of pasture and hayland are planted mainly in improved bermudagrass. Applications of lime and fertilizer are needed to sustain yields.

The major soils have some limitations affecting most urban uses. These limitations are mainly the sandy surface layer, slope, and seepage. The limitations can be overcome by properly designing and installing building foundations, septic tank absorption fields, and roads and streets.

9. Bremond-Wilson

Nearly level or very gently sloping, moderately well drained, loamy soils that formed in alkaline loamy and clayey fluvial terrace sediments

The soils of this map unit typically are on broad, nearly level, low terraces of the Brazos and Little Brazos Rivers, mainly in the vicinity of the town of Calvert, inside the city limits and west toward the Little Brazos River. Slopes are 0 to 3 percent. The underlying material of the soils is interbedded loamy and clayey fluvial terrace deposits.

This map unit makes up about 1 percent of the county. It is about 44 percent Bremond soils, 25 percent Wilson soils, and 31 percent soils of minor extent.

Bremond soils are on very gently sloping, slightly convex ridges. When mapped in a complex with the Wilson soils, they are in the form of rounded or elongated mounds. Typically, the surface layer is yellowish brown fine sandy loam about 7 inches thick. The subsoil, from a depth of 7 to 65 inches, is brownish and yellowish clay that has mottles in shades of red, brown, yellow, and gray. From a depth of about 65 to 80 inches, it is yellowish brown clay loam that has light brownish gray and yellowish brown mottles. These soils are strongly acid in the surface layer and neutral or slightly alkaline in the subsoil.

Wilson soils are in nearly level to weakly concave areas. Typically, the surface layer is dark grayish brown loam about 7 inches thick. The subsoil, from a depth of 7 to 19 inches, is very dark gray clay loam. From a depth of 19 to 42 inches, it is grayish clay that has brown mottles in the lower part. From a depth of about 42 to 67 inches, it is brownish and grayish clay. The underlying material, from a depth of about 67 to 80 inches, is mottled light gray and light brown clay. These soils are neutral in the surface layer and range from neutral to moderately alkaline in the subsoil.

Of minor extent in this unit are Chazos, Sandow, Tabor, and Uhland soils. Chazos and Tabor soils are on nearly level to weakly convex ridges. Sandow and Uhland soils are on flood plains.

The soils of this map unit are used mainly as pasture and hayland. In some areas, they are used as rangeland. Some areas of the Wilson soils are planted in cotton, corn, or grain sorghum.

Common bermudagrass, improved bermudagrass, kleingrass, and dallisgrass are the main pasture and hayland plants. Applications of fertilizer are needed to sustain yields.

The main native plants are bluestems, indiangrass, and paspalums. Post oak and elm are the dominant trees and grow mainly on the Bremond soils. Overgrazing by livestock increases the growth of undesirable plants and increases the hazard of water erosion in the more sloping areas.

The major soils have limitations affecting most urban uses. These limitations include a very high potential for shrinking and swelling, very slow permeability, and low soil strength. The limitations can be overcome by properly designing and installing building foundations, septic tank absorption fields, and roads and streets.

10. Bastrop-Burleson

Very gently sloping and nearly level, well drained and moderately well drained, loamy and clayey soils that formed in loamy and clayey alkaline fluvial terrace sediments

The soils of this map unit typically are in broad, smooth areas and on convex ridges and side slopes of terraces adjacent to the Brazos River flood plain. The Bastrop soils commonly appear as terrace "islands" bounded by alluvial soils on the flood plain. Slopes range from 0 to 3 percent. The underlying material is loamy and clayey alluvium.

This map unit makes up about 1 percent of the county. It is about 41 percent Bastrop soils, 31 percent Burleson soils, and 28 percent soils of minor extent.

Bastrop soils are on very gently sloping convex ridges. Typically, the surface layer is light brown fine sandy loam about 13 inches thick. The subsoil, from a depth of about 13 to 80 inches, is red sandy clay loam in the upper part and reddish yellow sandy clay loam in the lower part. The surface layer is moderately acid. The subsoil is moderately acid in the upper part and slightly acid in the lower part.

Burleson soils are in broad, smooth areas. Typically, the soils are clayey throughout. The surface layer is dark gray and is about 7 inches thick. The subsoil, from a depth of about 7 to 68 inches, is grayish with reddish mottles in the lower part. The underlying material, from a depth of about 68 to 80 inches, is yellowish red silty clay. These soils are moderately acid in the surface layer and neutral to moderately alkaline in the subsoil and underlying material.

Of minor extent in this map unit are Bremond, Chazos, Eufaula, Ships, Silawa, Silstid, and Uhland soils. Bremond soils are in the slightly higher convex areas on terraces. Chazos, Eufaula, and Silawa soils are on convex ridges on terraces. Ships and Uhland soils are on flood plains. Silstid soils are on adjacent side slopes on uplands.

The soils of this map unit are used mainly as cropland. Some areas are used as pasture and hayland. A few areas are used as rangeland.

The main crops are cotton, corn, grain sorghum, and small grains. In nearly level areas, the clayey surface layer can delay cultivation after prolonged periods of rainfall.

Common bermudagrass, improved bermudagrass, kleingrass, and dallisgrass are the main pasture and hayland plants. Applications of fertilizer are needed to sustain yields.

The main native plants are bluestems, indiangrass, and paspalums. Elm and pecan

are the dominant trees. Overgrazing by livestock increases the growth of undesirable plants and increases the hazard of water erosion in the more sloping areas.

The major soils have some limitations affecting most urban uses. These limitations include a very high potential for shrinking and swelling, very slow permeability, and low soil strength. The limitations can be overcome by properly designing and installing building foundations, septic tank absorption fields, and roads and streets.

Dominantly Loamy and Clayey Soils on Flood Plains

This group of general soil map units makes up about 18 percent of Robertson County. The major soils are Coarsewood, Highbank, Navasota, Oletha, Sandow, Ships, Uhland, Weswood, Whitesboro, Yahola, and Zilaboy. These soils developed in clayey and loamy sediments of Holocene age or Pleistocene age.

These nearly level to very gently sloping soils are on flood plains. They are somewhat poorly drained to well drained and are moderately permeable to very slowly permeable.

In this group, the soils on the Brazos River flood plain are used mainly as cropland. Soils on other flood plains in the county are used mainly as rangeland. A few areas are in pasture and hayland. Cotton, corn, and grain sorghum are the main crops grown in rarely flooded areas along the Brazos River. Bluestems, Virginia wildrye, broadleaf uniola, panicums, and sedges are the dominant native plants. Water oak, elm, cottonwood, and pecan are the dominant trees. Improved bermudagrass, common bermudagrass, and dallisgrass are the main pasture and hayland plants.

Flooding and a very high potential for shrinking and swelling prevent some of these soils from being used for most urban uses. However, many farmsteads are on rarely flooded soils on the Brazos River flood plain.

11. Ships-Highbank

Nearly level or very gently sloping, moderately well drained and well drained, clayey and loamy soils that formed in alkaline loamy and clayey alluvium (fig. 5)

The soils of this map unit typically are on nearly level flood plains of the Brazos River and the Little Brazos River. These soils are rarely flooded, and flooding is unlikely except under unusual weather conditions. Some areas are subject to frequent flooding. Slopes range from 0 to 3 percent. The underlying material is loamy and clayey sediments of Permian red beds deposited by the Brazos River.

This map unit makes up about 6 percent of the county. It is about 80 percent Ships soils, 11 percent Highbank soils, and 9 percent soils of minor extent.

Ships soils are in nearly level, broad areas and very gently sloping areas along drainageways on the Brazos River flood plain. Typically, the surface layer is dark reddish gray clay about 6 inches thick. The subsoil, from a depth of about 6 to 80 inches, is reddish brown and brown clay. These soils are moderately alkaline and are calcareous throughout.

Highbank soils are in nearly level, broad areas. Typically, the surface layer is brownish silty clay loam about 17 inches thick. The subsoil, from a depth of about 17 to 80 inches, is reddish brown clay. These soils are slightly alkaline or moderately alkaline and are calcareous throughout.

Of minor extent in this map unit are Roetex and Weswood soils. Roetex soils are in depressional areas. Weswood soils are on the slightly higher flood plains.

The soils of this map unit are used mainly as cropland. Some areas are used as pasture and hayland. A few areas are in rangeland, mainly along drainageways within the Brazos River flood plain.

Cotton, corn, and grain sorghum are the main crops. Minor crops include soybeans,

alfalfa, and small grains. The clayey surface layer can delay cultivation after periods of prolonged rainfall.

Common bermudagrass, improved bermudagrass, and dallisgrass are the main pasture and hayland plants. Applications of fertilizer are needed for optimum forage yields.

Virginia wildrye, broadleaf uniola, and sedges are the main native plants. Elm, pecan, and cottonwood are the dominant trees.

The major soils have some limitations affecting most urban uses. These limitations include flooding, a very high potential for shrinking and swelling, and very slow permeability. Most of the soils in this map unit are rarely flooded; flooding occurs no more than 5 times in a 100-year period. Flooding is a greater hazard in concave areas and in low areas adjacent to the Brazos and Little Brazos Rivers.

12. Weswood-Yahola-Coarsewood

Nearly level and very gently sloping, well drained, loamy soils that formed in alkaline loamy alluvial sediments (fig. 5)

The soils of this map unit typically are on the flood plain of the Brazos River, mainly in broad, smooth areas. The sloping areas are adjacent to drainageways within the flood plain. Slopes range from 0 to 3 percent. The underlying material is stratified, calcareous, loamy alluvial sediments.

This map unit makes up about 6 percent of the county. It is about 52 percent Weswood soils, 17 percent Yahola soils, 9 percent Coarsewood soils, and 22 percent soils of minor extent.

Weswood soils are in nearly level, broad, smooth areas and very gently sloping areas along drainageways on the Brazos River flood plain. Typically, the surface layer is brown silt loam about 4 inches thick. The subsoil, from a depth of about 4 to 64 inches, consists of stratified layers of brownish loam, very fine sandy loam, silt loam, and silty clay loam. From a depth of about 64 to 80 inches, it is stratified brown and very dark gray silty clay. These soils are slightly alkaline or moderately alkaline and are calcareous throughout.

Yahola soils are on nearly level or very gently sloping natural levees and point bars on the flood plain of the Brazos River. The surface layer is brown fine sandy loam about 13 inches thick. The underlying material, from a depth of about 13 to 80 inches, consists of stratified layers of pink, light brown, and reddish yellow very fine sandy loam and fine sandy loam. These soils are moderately alkaline and are calcareous throughout.

Coarsewood soils are in nearly level, broad, smooth areas and very gently sloping areas along drainageways on the Brazos River flood plain. The surface layer is brown silt loam about 5 inches thick. The subsoil, from a depth of about 5 to 44 inches, is brownish and pink silt loam. The underlying material, from a depth of about 44 to 80 inches, is very pale brown, light brown, and reddish yellow silt loam. These soils are slightly alkaline or moderately alkaline and are calcareous throughout.

Of minor extent in this map unit are Gaddy, Highbank, Roetex, and Ships soils. Gaddy soils are on sandbars adjacent to the Brazos River. Roetex soils are in depressional areas. Ships and Highbank soils are in the slightly lower areas on flood plains.

The soils of this map unit are used mainly as cropland. Some areas are used as pasture and hayland. Areas in rangeland generally are along drainageways within the Brazos River flood plain.

Cotton, corn, and grain sorghum are the main crops. Minor crops include soybeans, alfalfa, and small grains. Much of the cropland is irrigated. Some areas are planted in

pecan orchards. Because of the high silt content, cultivating the soils while they are wet can result in compacted layers.

Improved bermudagrass and common bermudagrass are the main pasture and hayland plants. Applications of fertilizer are necessary for sustained yields.

The main native plants are bluestems, indiagrass, and Canada wildrye. Cottonwood, elm, and pecan are the dominant trees.

The major soils have some limitations affecting most urban uses. These limitations include seepage and the hazard of flooding. Most of the soils in this map unit are rarely flooded; flooding occurs no more than 5 times in a 100-year period. Flooding is a greater hazard in concave areas and in low areas adjacent to the Brazos and Little Brazos Rivers.

13. Uhland-Sandow-Whitesboro

Nearly level, moderately well drained, loamy soils that formed in sandy and loamy alluvial sediments

The soils of this map unit are on flood plains of streams. The Uhland soils are on flood plains that drain areas of sandier soils. The Sandow and Whitesboro soils are on flood plains that drain loamy and clayey soils. Slopes are 0 to 1 percent. The underlying material is stratified sandy and loamy alluvial sediments.

This map unit makes up about 4 percent of the county. It is about 40 percent Uhland soils, 33 percent Sandow soils, 8 percent Whitesboro soils, and 19 percent soils of minor extent.

Uhland soils are in nearly level, broad areas and on natural levees of drainageways. The surface layer is grayish brown loam about 3 inches thick. The subsoil, from a depth of about 3 to 15 inches, is pale brown very fine sandy loam that has strong brown and dark grayish brown mottles. From a depth of 15 to 55 inches, it is brownish and grayish loam and very fine sandy loam and has brownish and grayish mottles. From a depth of 55 to 80 inches, it is gray clay loam and has dark yellowish brown mottles. These soils are slightly acid in the surface layer and slightly acid or moderately acid in the subsoil.

Sandow soils are in nearly level, broad areas. The surface layer is brown loam about 9 inches thick. The subsoil, from a depth of about 9 to 80 inches, is brownish loam and clay loam and has brownish and yellowish mottles. These soils are moderately acid in the surface layer and slightly acid or neutral in the subsoil.

Whitesboro soils are in nearly level, broad areas. The surface and subsurface layers are dark grayish brown and brown clay loam about 22 inches thick. The subsoil, from a depth of about 22 to 29 inches, is brown clay loam that has light brownish gray mottles. From a depth of 29 to 80 inches, it is grayish and brownish loam. These soils are slightly acid in the surface and subsurface layers and neutral in the subsoil.

Of minor extent in this map unit are Edge, Eufaula, Hearne, Oletha, Padina, Rader, Robco, Silawa, Silstid, and Zilaboy soils. Eufaula and Silawa soils are on sandy ridges of terraces. Oletha and Zilaboy soils are in the slightly lower areas on flood plains. Edge, Hearne, Padina, and Silstid soils are on upland ridges and side slopes adjacent to the flood plains. Rader and Robco soils are in concave areas at the head of drainageways.

The soils of this map unit are used mainly as rangeland. Some areas are used as pasture. These soils generally are not used as cropland because of the frequent flooding.

The main native plants are Virginia wildrye, bluestems, panicums, and eastern gamagrass. Elm, water oak, willow, and pecan are the dominant trees.

Common bermudagrass and dallisgrass are the main pasture plants. Applications of fertilizer and lime are necessary to sustain yields.

The major soils have some limitations affecting most urban uses. These limitations include wetness and the hazard of flooding. These soils are not suitable for most urban uses.

14. Zilaboy-Navasota-Oletha

Nearly level, moderately well drained and somewhat poorly drained, clayey soils that formed in loamy and clayey alluvial sediments

The soils of this map unit are on flood plains, mainly of the Navasota River and Walnut Creek. Slopes are 0 to 1 percent. The underlying material is loamy and clayey sediments.

This map unit makes up about 2 percent of the county. It is about 46 percent Zilaboy soils, 28 percent Navasota soils, 10 percent Oletha soils, and 16 percent soils of minor extent.

Zilaboy soils are in nearly level, broad, smooth areas. The surface layer is gray clay about 7 inches thick. The subsoil, from a depth of about 7 to 64 inches, is grayish brown and dark grayish brown clay that has strong brown and brown mottles. From a depth of 64 to 80 inches, it is grayish brown clay that has brown and light brownish gray mottles. These soils are slightly acid in the surface layer and moderately acid or slightly acid in the subsoil.

Navasota soils are in slightly concave areas. The surface layer is gray clay about 7 inches thick. The subsoil, from a depth of about 7 to 80 inches, is light brownish gray clay that has brownish mottles in the upper part and brownish and grayish mottles in the lower part. These soils are moderately acid throughout.

Oletha soils are in nearly level, small areas. The surface layer is dark gray clay about 6 inches thick. The subsoil, from a depth of about 6 to 72 inches, is grayish brown and gray sandy clay loam. The underlying material, from a depth of about 72 to 80 inches, is light brownish gray fine sandy loam. The surface layer and subsoil are strongly acid, and the underlying material is slightly acid.

Of minor extent in this map unit are Rader, Sandow, and Uhland soils. Rader soils are in nearly level to concave areas on adjacent uplands. Sandow and Uhland soils are in areas that are slightly higher on flood plains.

The soils of this map unit are used mainly as rangeland. Some areas are used as pasture. These soils generally are not used as cropland because of the frequent flooding.

The main native plants are Virginia wildrye, broadleaf uniola, eastern gamagrass, and sedges. Elm, ash, and water oak are the dominant trees.

Common bermudagrass and dallisgrass are the main pasture plants. Applications of fertilizer are needed for sustained yields.

The major soils have some limitations affecting most urban uses. These limitations include flooding, a very high potential for shrinking and swelling, and very slow permeability. These soils are not suitable for most urban uses.

Detailed Soil Map Units

The map units delineated on the detailed maps represent the soils or miscellaneous areas in the survey area. The map unit descriptions in this section, along with the maps, can be used to determine the suitability and potential of a unit for specific uses. They also can be used to plan the management needed for those uses. More information about each map unit is given under the heading “Use and Management of the Soils.”

A map unit delineation on a map represents an area dominated by one or more major kinds of soil or miscellaneous areas. A map unit is identified and named according to the taxonomic classification of the dominant soils or miscellaneous areas. Within a taxonomic class there are precisely defined limits for the properties of the soils. On the landscape, however, the soils and miscellaneous areas are natural phenomena, and they have the characteristic variability of all natural phenomena. Thus, the range of some observed properties may extend beyond the limits defined for a taxonomic class. Areas of soils of a single taxonomic class rarely, if ever, can be mapped without including areas of other taxonomic classes. Consequently, every map unit is made up of the soils or miscellaneous areas for which it is named and some “included” areas that belong to other taxonomic classes.

Most included soils have properties similar to those of the dominant soil or soils in the map unit, and thus they do not affect use and management. These are called noncontrasting, or similar, inclusions. They may or may not be mentioned in the map unit description. Other included soils and miscellaneous areas, however, have properties and behavioral characteristics divergent enough to affect use or to require different management. These are called contrasting, or dissimilar, inclusions. They generally are in small areas and could not be mapped separately because of the scale used. Some small areas of strongly contrasting soils or miscellaneous areas are identified by a special symbol on the maps. The included areas of contrasting soils or miscellaneous areas are mentioned in the map unit descriptions. A few included areas may not have been observed, and consequently they are not mentioned in the descriptions, especially where the pattern was so complex that it was impractical to make enough observations to identify all the soils and miscellaneous areas on the landscape.

The presence of included areas in a map unit in no way diminishes the usefulness or accuracy of the data. The objective of mapping is not to delineate pure taxonomic classes but rather to separate the landscape into landforms or landform segments that have similar use and management requirements. The delineation of such segments on the map provides sufficient information for the development of resource plans, but if intensive use of small areas is planned, onsite investigation is needed to define and locate the soils and miscellaneous areas.

An identifying symbol precedes the map unit name in the map unit descriptions. Each description includes general facts about the unit and gives the principal hazards and limitations to be considered in planning for specific uses.

Soils that have profiles that are almost alike make up a *soil series*. Except for differences in texture of the surface layer, all the soils of a series have major horizons that are similar in composition, thickness, and arrangement.

Soils of one series can differ in texture of the surface layer, slope, stoniness,

salinity, degree of erosion, and other characteristics that affect their use. On the basis of such differences, a soil series is divided into *soil phases*. Most of the areas shown on the detailed soil maps are phases of soil series. The name of a soil phase commonly indicates a feature that affects use or management. For example, Edge fine sandy loam, 1 to 5 percent slopes, is a phase of the Edge series.

Some map units are made up of two or more major soils or miscellaneous areas. These map units are complexes. A *complex* consists of two or more soils or miscellaneous areas in such an intricate pattern or in such small areas that they cannot be shown separately on the maps. The pattern and proportion of the soils or miscellaneous areas are somewhat similar in all areas. Bremond-Wilson complex, 0 to 1 percent slopes, is an example.

This survey includes some map units that are *miscellaneous areas*. Such areas have little or no soil material and support little or no vegetation. Pits and Dumps is an example.

Table 4 gives the acreage and proportionate extent of each map unit. Other tables (see "Contents") give properties of the soils and the limitations, capabilities, and potentials for many uses. The Glossary defines many of the terms used in describing the soils or miscellaneous areas.

AaD—Arenosa fine sand, 1 to 8 percent slopes

Setting

Landform: Upland

Landscape position: Broad ridges and side slopes

Slope: Very gently sloping to moderately sloping; plane or convex surfaces; dominantly 1 to 5 percent slopes

Shape of areas: Irregular to somewhat rounded

Size of areas: 10 to 350 acres

Typical Profile

Surface layer:

0 to 8 inches—pale brown, very strongly acid fine sand

Underlying material:

8 to 43 inches—pale brown, very strongly acid fine sand

43 to 80 inches—very pale brown, very strongly acid fine sand

Soil Properties

Depth: Very deep

Drainage class: Somewhat excessively drained

Water table: None within a depth of 6 feet

Flooding: None

Runoff: Very low

Permeability of most restrictive layer within a depth of 60 inches: Rapid

Available water capacity: Very low

Root zone: Very deep

Natural soil fertility: Very low

Shrink-swell potential: Low

Hazard of water erosion: Slight

Composition

Arenosa soil and similar inclusions: 90 to 95 percent

Contrasting inclusions: 5 to 10 percent

Inclusions

Similar inclusions:

- The moderately permeable Padina soils in similar broad, smooth areas
- Eufaula soils on broad, smooth terraces

Contrasting inclusions:

- The poorly drained Cadelake soils in narrow drainageways
- The well drained, slowly permeable Hearne soils on the higher ridgetops
- The moderately well drained, slowly permeable Robco soils on the lower side slopes and in concave areas
- The well drained, moderately slowly permeable Rosanky soils on the lower convex ridgetops

Use and Management

Major land use: Rangeland

Other land uses: Pasture

Pasture

Major limitations:

- Very low available water capacity and rapid permeability severely limit yield potential for most improved grasses.
- Because the rapid permeability allows fertilizer and lime to leach through the root zone, applications of fertilizer and lime need to be frequent and light.
- Seepage is a problem for livestock ponds, and pond construction is not recommended.

Cropland

Major limitations:

- Because of the low available water capacity and rapid permeability, this soil is unsuitable for growing most crops.

Minor limitations:

- When dry, the soil is loose and provides poor traction for farm machinery.

Rangeland

Major limitations:

- The very low available water capacity and rapid permeability limit native vegetation to drought-tolerant plants.
- The very low natural fertility limits the growth of native plants.
- Seepage is a problem for livestock ponds, and pond construction is not recommended.

Urban development

Major limitations:

- Because of the rapid permeability, effluents can seep into ground water when soil is used for septic tank absorption fields.
- The excavation sidewalls are unstable because of the sandy texture of the soil.
- Because of the the very low available water capacity and very low natural fertility, lawn grasses and landscape plants are more expensive to establish and maintain.

Minor limitations:

- The slope is a limitation affecting the construction of small commercial buildings.

Interpretive Groups

Land capability classification (nonirrigated areas): 4s

Ecological site: Very Deep Sand

Pasture management group: Very Deep Sandy

BaB—Bastrop fine sandy loam, 1 to 3 percent slopes

Setting

Landform: Stream terrace

Landscape position: Small ridges and upper side slopes

Slope: Very gently sloping; convex surfaces

Shape of areas: Elongated or irregular

Size of areas: 20 to 500 acres

Typical Profile

Surface layer:

0 to 13 inches—light brown, moderately acid fine sandy loam

Subsoil:

13 to 35 inches—red, moderately acid sandy clay loam

35 to 52 inches—red, slightly acid sandy clay loam

52 to 70 inches—light red, slightly acid sandy clay loam

70 to 80 inches—reddish yellow, slightly acid sandy clay loam

Soil Properties

Depth: Very deep

Drainage class: Well drained

Water table: None within a depth of 6 feet

Flooding: None

Runoff: Low

Permeability of most restrictive layer within a depth of 60 inches: Moderate

Available water capacity: High

Root zone: Very deep

Natural soil fertility: Moderate

Shrink-swell potential: Low

Hazard of water erosion: Moderate

Composition

Bastrop soil and similar inclusions: 85 to 95 percent

Contrasting inclusions: 5 to 15 percent

Inclusions

Similar inclusions:

- The moderately well drained, slowly permeable Chazos soils and the well drained, moderately permeable Silawa soils on similar convex ridges

Contrasting inclusions:

- The moderately well drained, very slowly permeable Bremond soils on the slightly higher convex ridges
- The moderately well drained, very slowly permeable Burleson soils in broad, smooth areas
- The somewhat excessively drained Desan and well drained Dutek soils on the slightly higher convex ridges and side slopes

Use and Management

Major land use: Rangeland

Other land uses: Pasture and cropland

Pasture

Major limitations: None

Minor limitations:

- The hazard of water erosion is moderate during seedbed preparation for improved grasses.
- Seepage is a problem for livestock ponds, and pond construction is not recommended.

Cropland

Major limitations: None

Minor limitations:

- The hazard of water erosion is moderate when soil is cultivated.

Rangeland

Major limitations: None

Minor limitations:

- The moderate natural fertility limits the yield potential of native plants.
- Seepage is a problem for livestock ponds, and pond construction is not recommended.

Urban development

Major limitations: None

Minor limitations:

- The low soil strength is a limitation affecting the construction of local roads and streets.
- The risk of corrosion is moderate for uncoated steel.

Interpretive Groups

Land capability classification (nonirrigated areas): 2e

Ecological site: Sandy Loam

Pasture management group: Loamy Upland

BeB—Benchley clay loam, 1 to 3 percent slopes

Setting

Landform: Upland

Landscape position: Lower side slopes along small drainageways or concave areas at the head of drainageways

Slope: Very gently sloping; concave surfaces

Shape of areas: Oblong to elongated

Size of areas: 20 to 200 acres

Typical Profile

Surface layer:

0 to 13 inches—very dark grayish brown, slightly acid clay loam

Subsoil:

13 to 20 inches—very dark grayish brown, moderately acid clay loam that has red and yellowish brown mottles

Soil Survey of Robertson County, Texas

20 to 28 inches—mottled red and light olive brown, moderately acid clay
28 to 42 inches—brownish yellow, moderately acid clay that has red mottles
42 to 54 inches—light olive brown neutral clay
54 to 64 inches—yellowish brown neutral clay that has thin strata of shale

Underlying material:

64 to 80 inches—stratified light gray, neutral shale and yellowish red sandy clay

Soil Properties

Depth: Very deep

Drainage class: Moderately well drained

Water table: None within a depth of 6 feet

Flooding: None

Runoff: High

Permeability of most restrictive layer within a depth of 60 inches: Slow

Available water capacity: High

Root zone: Very deep

Natural soil fertility: High

Shrink-swell potential: High

Hazard of water erosion: Moderate

Composition

Benchley soil and similar inclusions: 85 to 95 percent

Contrasting inclusions: 5 to 15 percent

Inclusions

Similar inclusions:

- The very slowly permeable Crockett soils on the slightly higher convex ridgetops and side slopes
- The very slowly permeable Wilson soils in the slightly lower, nearly level areas

Contrasting inclusions:

- The very slowly permeable Dimebox soils on the slightly higher broad ridgetops
- The very slowly permeable Luling soils on the slightly higher broad ridges and upper side slopes

Use and Management

Major land use: Rangeland

Other land uses: Cropland and pasture

Pasture

Major limitations: None

Minor limitations:

- The hazard of water erosion is moderate during seedbed preparation for improved grasses.
- The slow permeability restricts water movement and the root development of improved grasses.

Cropland

Major limitations: None

Minor limitations:

- The hazard of water erosion is moderate when soil is cultivated.
- The slow permeability restricts water movement and root development of crops.

Rangeland

Major limitations: None

Minor limitations:

- The slow permeability restricts water movement and the root development of native plants.

Urban development

Major limitations:

- The potential for shrinking and swelling can cause structural damage to residential and small commercial buildings.
- The shrink-swell potential and low soil strength are limitations affecting the construction of local roads and streets.
- The slow permeability can interfere with the proper functioning of septic tank absorption fields.
- The risk of corrosion is high for uncoated steel.

Interpretive Groups

Land capability classification (nonirrigated areas): 2e

Ecological site: Clay Loam

Pasture management group: Loamy Upland

BeC—Benchley clay loam, 3 to 5 percent slopes

Setting

Landform: Upland

Landscape position: Side slopes adjacent to small drainageways or concave areas at the heads of drainageways

Slope: Gently sloping; concave surfaces

Shape of areas: Oblong to irregular

Size of areas: 20 to 100 acres

Typical Profile

Surface layer:

0 to 10 inches—very dark grayish brown, slightly acid clay loam

Subsoil:

10 to 18 inches—dark brown, moderately acid clay loam

18 to 45 inches—red, moderately acid clay that has yellowish brown and brown mottles

45 to 62 inches—yellowish brown, slightly acid clay that has red and gray mottles

Underlying material:

62 to 80 inches—stratified light gray, neutral shale and yellowish red clay

Soil Properties

Depth: Very deep

Drainage class: Moderately well drained

Water table: None within a depth of 6 feet

Flooding: None

Runoff: High

Permeability of most restrictive layer within a depth of 60 inches: Slow

Available water capacity: High

Root zone: Very deep

Soil Survey of Robertson County, Texas

Natural soil fertility: High
Shrink-swell potential: High
Hazard of water erosion: Severe

Composition

Benchley soil and similar inclusions: 85 to 95 percent
Contrasting inclusions: 5 to 15 percent

Inclusions

Similar inclusions:

- Soils similar to the Benchley soil; on slopes of more than 5 percent
- The very slowly permeable Crockett soils on similar side slopes

Contrasting inclusions:

- The very slowly permeable Luling soils on similar side slopes
- The well drained, moderately slowly permeable Rosanky soils on the slightly higher ridges on adjacent geologic members

Use and Management

Major land use: Rangeland

Other land uses: Cropland and pasture

Pasture

Major limitations:

- The hazard of erosion is severe during seedbed preparation for improved grasses

Minor limitations:

- The slow permeability restricts water movement and the root development of improved grasses.

Cropland

Major limitations:

- The hazard of water erosion is severe when the soil is cultivated.

Minor limitations:

- The slow permeability restricts water movement and the root development of crops.

Rangeland

Major limitations: None

Minor limitations:

- The slow permeability restricts water movement and the root development of native plants.

Urban development

Major limitations:

- The high potential for shrinking and swelling can cause structural damage to residential and small commercial buildings.
- The shrink-swell potential and low soil strength are limitations affecting the construction of local roads and streets.
- The slow permeability of the subsoil can interfere with the proper functioning of septic tank absorption fields.
- The risk of corrosion is high for uncoated steel.

Interpretive Groups

Land capability classification (nonirrigated areas): 3e

Ecological site: Clay Loam

Pasture management group: Loamy Upland

BrB—Bremond fine sandy loam, 1 to 3 percent slopes

Setting

Landform: Terrace and terrace remnant associated with erosional uplands

Landscape position: Ridges and side slopes

Slope: Very gently sloping; convex surfaces

Shape of areas: Irregular to oblong

Size of areas: 20 to 200 acres

Typical Profile

Surface layer:

0 to 7 inches—yellowish brown, strongly acid fine sandy loam

Subsoil:

7 to 14 inches—reddish brown, moderately acid clay that has dark red and red mottles

14 to 31 inches—light olive brown, neutral clay that has yellowish brown mottles

31 to 50 inches—brown, slightly alkaline clay that has olive yellow and red mottles

50 to 65 inches—brownish yellow, neutral clay that has light brownish gray and red mottles

65 to 80 inches—yellowish brown, neutral clay loam that has light brownish gray and yellowish brown mottles

Soil Properties

Depth: Very deep

Drainage class: Moderately well drained

Water table: None within a depth of 6 feet

Flooding: None

Runoff: Very high

Permeability of most restrictive layer within a depth of 60 inches: Very slow

Available water capacity: High

Root zone: Very deep

Natural soil fertility: Low

Shrink-swell potential: High

Hazard of water erosion: Moderate

Composition

Bremond soil and similar inclusions: 80 to 95 percent

Contrasting inclusions: 5 to 20 percent

Inclusions

Similar inclusions:

- The well drained, moderately permeable Bastrop soils on similar or slightly lower convex ridges
- Crockett soils on the slightly higher, broad ridges on uplands
- Tabor soils in similar and slightly lower areas

Contrasting Inclusions:

- Burleson soils in the slightly lower, nearly level areas
- The slowly permeable Chazos soils on the slightly higher convex ridges
- Lufkin soils in the slightly lower, nearly level areas
- The well drained, moderately permeable Silawa soils on the slightly higher convex ridges
- Wilson soils in the slightly lower, nearly level areas

Use and Management

Major land use: Pasture

Other land uses: Cropland and rangeland

Pasture

Major limitations:

- The very slow permeability restricts water movement and the root development of improved grasses.

Minor limitations:

- Water erosion is a moderate hazard during seedbed preparation for improved grasses.

Cropland

Major limitations:

- The very slow permeability restricts water movement and development of crops.

Minor limitations:

- Water erosion is a moderate hazard when soil is cultivated.

Rangeland

Major limitations:

- The very slow permeability restricts water movement and the root development of native plants.
- The low natural fertility limits the yield potential of native plants.

Urban development

Major limitations:

- The high potential for shrinking and swelling can cause structural damage to residential and small commercial buildings.
- The very slow permeability can interfere with the proper functioning of septic tank absorption fields.
- The potential for shrinking and swelling and the low soil strength are limitations affecting the construction of roads and streets.
- The risk of corrosion is high for uncoated steel.

Interpretive Groups

Land capability classification (nonirrigated areas): 3e

Ecological site: Claypan Prairie

Pasture management group: Loamy Claypan

BsA—Bremond-Wilson complex, 0 to 1 percent slopes

Setting

Landform: Stream terrace

Distinctive landscape features: Landscape is mounded

Landscape position: Bremond—broad smooth areas on convex mounds; Wilson—broad smooth areas in the concave intermounds

Slope: Nearly level; low convex ridges and slightly concave areas

Shape of areas: Broad and irregular

Size of areas: 20 to 300 acres

Typical Profile

Bremond

Surface layer:

0 to 8 inches—pale brown, moderately acid fine sandy loam

Subsoil:

8 to 15 inches—brown, slightly acid clay that has brownish yellow mottles

15 to 50 inches—light yellowish brown, neutral clay that has yellowish brown and strong brown mottles

50 to 65 inches—light brownish gray, moderately alkaline clay that has yellowish red mottles

Underlying material:

65 to 80 inches—reddish brown, moderately alkaline clay

Wilson

Surface layer:

0 to 6 inches—grayish brown, slightly acid loam

Subsoil:

6 to 21 inches—dark gray, neutral clay

21 to 40 inches—grayish brown, slightly alkaline clay

40 to 52 inches—pale brown, slightly alkaline clay that has grayish brown mottles

52 to 68 inches—light gray, moderately alkaline clay loam

Underlying material:

68 to 80 inches—reddish yellow, moderately alkaline silty clay loam

Soil Properties

Depth: Very deep

Drainage class: Moderately well drained

Water table: Bremond—none within a depth of 6 feet; Wilson—none within a depth of 6 feet (the surface layer and upper part of subsoil, however, are seasonally wet during winter and spring for 10 to 30 days)

Flooding: None

Runoff: High

Permeability of most restrictive layer within a depth of 60 inches: Very slow

Available water capacity: Bremond—high; Wilson—moderate

Root zone: Very deep

Natural soil fertility: Moderate

Shrink-swell potential: High

Hazard of water erosion: Slight

Composition

Note: These Bremond and Wilson soils occur as areas so small and intricately mixed that mapping them separately was not practical.

Bremond soil and similar inclusions: 40 to 55 percent

Wilson soil and similar inclusions: 35 to 45 percent

Contrasting inclusions: 5 to 15 percent

Inclusions

Similar inclusions:

- Lufkin soils in similar, nearly level areas



Figure 6.—Native wildflowers in an area of Bremond-Wilson complex, 0 to 1 percent slopes.

Contrasting inclusions:

- Burleson soils in similar, nearly level areas
- The well drained, moderately permeable Silawa soils on the slightly higher convex ridges

Use and Management

Major land use: Rangeland

Other land uses: Cropland and pasture (fig. 6)

Pasture

Major limitations:

- The very slow permeability restricts water movement and the root development of improved grasses.
- Improved grasses are difficult to establish and maintain during the wet season.

Cropland

Major limitations:

- The very slow permeability restricts water movement and the root development of crops.

Minor limitations:

- Seasonal wetness can hinder seed germination and tillage operations.

Rangeland

Major limitations:

- The very slow permeability restricts water movement and the root development of native plants.

Minor limitations:

- The moderate natural fertility limits the yield potential of native plants.

Urban development

Major limitations:

- The high potential for shrinking and swelling can cause structural damage to residential and small commercial buildings.
- The very slow permeability can interfere with the proper functioning of septic absorption fields.
- The potential for shrinking and swelling and low soil strength are limitations affecting the construction of local roads and streets.
- The risk of corrosion is high for uncoated steel.

Interpretive Groups

Land capability classification (nonirrigated areas): Bremond—2w; Wilson—3w

Ecological site: Claypan Prairie

Pasture management group: Seasonally Wet Loamy Claypan

BuA—Burleson clay, 0 to 1 percent slopes

Setting

Landform: Stream terrace

Distinctive landscape features: Gilgai microrelief in undisturbed areas

Landscape position: Broad, smooth areas

Slope: Nearly level; plane surfaces

Shape of areas: Somewhat elongated to irregular

Size of areas: 10 to 200 acres

Typical Profile

Surface layer:

0 to 7 inches—dark gray, moderately acid clay

Subsoil:

7 to 32 inches—very dark gray, neutral clay

32 to 55 inches—dark gray, moderately alkaline clay

55 to 68 inches—gray, moderately alkaline clay that has yellowish red mottles

Underlying material:

68 to 80 inches—yellowish red, moderately alkaline silty clay

Soil Properties

Depth: Very deep

Drainage class: Moderately well drained

Water table: None within a depth of 6 feet

Flooding: None

Runoff: High

Permeability of most restrictive layer within a depth of 60 inches: Very slow

Available water capacity: High

Root zone: Very deep

Natural soil fertility: High

Shrink-swell potential: Very high

Hazard of water erosion: Slight

Composition

Burleson soil and similar inclusions: 85 to 95 percent

Contrasting inclusions: 5 to 15 percent

Inclusions

Similar inclusions:

- Wilson soils in similar, nearly level areas

Contrasting inclusions:

- Bremond soils and the well drained, moderately permeable Silawa soils in the slightly higher convex areas

Use and Management

Major land use: Pasture

Other land uses: Rangeland and cropland

Pasture

Major limitations:

- The very slow permeability restricts water movement and the root development of improved grasses.
- The clayey surface layer requires a well prepared seedbed for establishment of improved grasses.

Minor limitations:

- Seepage due to underlying sand strata can limit the construction of livestock ponds in some areas.

Cropland

Major limitations:

- The very slow permeability restricts water movement and the root development of crops.

Minor limitations:

- Tillage is difficult when the clay surface layer is too wet or too dry.
- Extended periods of wetness delay field operations.

Rangeland

Major limitations:

- The very slow permeability restricts water movement and the root development of native plants.

Minor limitations:

- Seepage due to underlying sand strata can limit the construction of livestock ponds in some areas.

Urban development

Major limitations:

- The high potential for shrinking and swelling can cause structural damage to residential and small commercial buildings.
- The very slow permeability can interfere with the proper functioning of septic tank absorption fields.
- The shrink-swell potential and low soil strength are limitations affecting the construction of local roads and streets.
- The risk of corrosion is high for uncoated steel.

Interpretive Groups

Land capability classification (nonirrigated areas): 2w

Ecological site: Blackland

Pasture management group: Clayey

CaA—Cadelake fine sandy loam, 0 to 2 percent slopes

Setting

Landform: Upland

Landscape position: Poorly defined drainageways and concave areas

Slope: Nearly level; concave surfaces

Shape of areas: Elongated

Size of areas: 5 to 50 acres

Typical Profile

Surface layer:

0 to 8 inches—very dark gray, extremely acid fine sandy loam

Subsurface layer:

8 to 18 inches—dark gray, extremely acid loamy fine sand that has small masses of gray loamy fine sand

Subsoil:

18 to 23 inches—light gray, very strongly acid fine sand

23 to 43 inches—light gray, extremely acid fine sand that has a few olive yellow mottles in lower part

43 to 80 inches—white, very strongly acid fine sand that has a few olive yellow mottles

Soil Properties

Depth: Very deep

Drainage class: Poorly drained

Water table: At a depth of as much as 1.5 feet throughout the year

Flooding: None

Runoff: Negligible

Permeability of most restrictive layer within a depth of 60 inches: Rapid

Available water capacity: Low

Root zone: Very deep

Natural soil fertility: Low

Shrink-swell potential: Low

Hazard of water erosion: Slight

Composition

Cadelake soil and similar inclusions: 85 to 95 percent

Contrasting inclusions: 5 to 15 percent

Inclusions

Similar inclusions:

- The moderately well drained, slowly permeable Robco soils on adjacent, slightly higher toeslopes and footslopes
- The moderately well drained, moderately slowly permeable Sandow soils in the lower positions on flood plains
- The moderately well drained, moderately slowly permeable Uhland soils in the slightly lower positions on flood plains

Contrasting inclusions:

- The somewhat excessively drained Arenosa soils and the well drained, moderately permeable Padina soils on adjacent higher convex ridges and side slopes
- The well drained, moderately permeable Silstid soils on the higher convex ridges and side slopes

Use and Management

Major land use: Rangeland

Other land uses: Pasture

Pasture

Major limitations:

- Because of the long-duration wetness, this soil is unsuitable for pasture.

Cropland

Major limitations:

- Because of long-duration wetness, this soil is unsuitable for growing crops.

Rangeland

Major limitations:

- Because of long-duration wetness, this soil is poorly suited to rangeland. Rangeland, however, is the best use for this map unit.

Urban development

Major limitations:

- Because of the long-duration wetness, this soil is unsuitable for most urban uses.
- Wetness is a limitation affecting the construction of local roads and streets.
- Excavation sidewalls are unstable because of the continuous wetness and the sandy texture of the soil.
- The risk of corrosion is high for uncoated steel and concrete.

Interpretive Groups

Land capability classification: 6w

Ecological site: Wet Sandy Draw

Pasture management group: Not Suited

ChC—Chazos loamy fine sand, 1 to 5 percent slopes

Setting

Landform: Stream terrace or terrace remnant on uplands

Landscape position: Ridges and side slopes

Slope: Very gently sloping or gently sloping; convex surfaces

Shape of areas: Elongated or oblong

Size of areas: 20 to 100 acres

Typical Profile

Surface layer:

0 to 6 inches—yellowish brown, slightly acid loamy fine sand

Subsurface layer:

6 to 14 inches—light yellowish brown, slightly acid loamy fine sand

Soil Survey of Robertson County, Texas

Subsoil:

14 to 22 inches—strong brown, moderately acid clay that has red and pale brown mottles

22 to 35 inches—pale brown, moderately acid clay loam that has red, dark red, and light brownish gray mottles

35 to 62 inches—pale brown, moderately acid sandy clay loam that has red, dark red, strong brown, and light brownish gray mottles

62 to 80 inches—brownish yellow, moderately acid sandy clay loam that has strong brown, red, and light brownish gray mottles

Soil Properties

Depth: Very deep

Drainage class: Moderately well drained

Water table: None within a depth of 6 feet

Flooding: None

Runoff: High

Permeability of most restrictive layer within a depth of 60 inches: Slow

Available water capacity: Moderate

Root zone: Very deep

Natural soil fertility: Moderate

Shrink-swell potential: Medium

Hazard of water erosion: Moderate

Composition

Chazos soil and similar inclusions: 85 to 95 percent

Contrasting inclusions: 5 to 15 percent

Inclusions

Similar inclusions:

- The well drained, moderately permeable Silawa soils on similar convex ridges
- The very slowly permeable Tabor soils in the slightly lower concave areas

Contrasting inclusions:

- The very slowly permeable Bremond soils on similar convex ridges or in the slightly lower areas
- The well drained, moderately permeable Gasil soils in the slightly higher positions on uplands
- The very slowly permeable Rader soils in the slightly lower, concave areas
- Robco soils in the lower concave areas on uplands

Use and Management

Major land use: Pasture

Other land uses: Rangeland and cropland

Pasture

Major limitations: None

Minor limitations:

- Water erosion is a moderate hazard during seedbed preparation for improved grasses.
- The slow permeability restricts water movement and the root development of improved grasses.
- The moderate available water capacity limits the growth of improved grasses during periods of drought.

Cropland

Major limitations: None

Minor limitations:

- Water erosion is a moderate hazard when this soil is cultivated.
- The slow permeability restricts water movement and the root development of crops.
- The moderate available water capacity limits the growth of crops during periods of drought.

Rangeland

Major limitations: None

Minor limitations:

- The slow permeability restricts water movement and the root development of native plants.
- The moderate available water capacity limits native plant growth during periods of drought.
- The moderate natural fertility limits the yield potential of native forage plants.

Urban development

Major limitations:

- The slow permeability can interfere with the proper functioning of septic tank absorption fields.
- The low soil strength is a limitation affecting the construction of local roads and streets.
- The risk of corrosion is high for uncoated steel.

Minor limitations:

- The shrink-swell potential is a limitation affecting the construction of residential and small commercial buildings.

Interpretive Groups

Land capability classification (nonirrigated areas): 3e

Ecological site: Sandy Loam

Pasture management group: Sandy Upland

CoA—Coarsewood silt loam, 0 to 1 percent slopes, rarely flooded

Setting

Landform: Flood plain

Landscape position: Broad, smooth areas within the flood plain of the Brazos River

Slope: Nearly level; plane surfaces

Shape of areas: Elongated to irregular

Size of areas: 20 to 200 acres

Typical Profile

Surface layer:

0 to 5 inches—brown, moderately alkaline silt loam

Subsoil:

5 to 9 inches—light brown, moderately alkaline silt loam

9 to 19 inches—light yellowish brown, moderately alkaline silt loam

19 to 44 inches—pink, slightly alkaline silt loam

Soil Survey of Robertson County, Texas

Underlying material:

44 to 59 inches—very pale brown, slightly alkaline silt loam that has thin strata of brown clay

59 to 70 inches—light brown, slightly alkaline silt loam that has thin strata of reddish brown clay

70 to 80 inches—reddish yellow, slightly alkaline silt loam

Soil Properties

Depth: Very deep

Drainage class: Well drained

Water table: None within a depth of 6 feet

Flooding: 1 to 5 times in 100 years; usually lasting less than 2 days

Runoff: Negligible

Permeability of most restrictive layer within a depth of 60 inches: Moderately rapid

Available water capacity: Moderate

Root zone: Very deep

Natural soil fertility: High

Shrink-swell potential: Low

Hazard of water erosion: Slight

Composition

Coarsewood soil and similar inclusions: 85 to 95 percent

Contrasting inclusions: 5 to 15 percent

Inclusions

Similar inclusions:

- The moderately permeable Weswood soils in similar positions on flood plains
- Yahola soils on the slightly higher natural levees adjacent to drainageways on flood plains

Contrasting inclusions:

- The slowly permeable Highbank soils and the moderately well drained, very slowly permeable Ships soils in the slightly lower positions on flood plains

Use and Management

Major land use: Cropland

Other land uses: Pasture and rangeland

Pasture

Major limitations:

- Seepage is a problem for livestock ponds, and pond construction is not recommended.

Minor limitations:

- The moderate available water capacity limits the growth of improved grasses during periods of drought.

Cropland

Major limitations: None

Minor limitations:

- A compacted layer can form below the surface layer if the soil is tilled while wet.
- The moderate available water capacity limits the growth of crops during periods of drought.
- Irrigated crops may require extra applications of water because of the moderately rapid permeability.

Rangeland

Major limitations:

- Seepage is a problem for livestock ponds, and pond construction is not recommended.

Minor limitations:

- The moderate available water capacity limits the growth of native plants during periods of drought.

Urban development

Major limitations:

- Because of the hazard of flooding, this soil is unsuitable for dwellings and most other urban uses.

Minor limitations:

- The low soil strength is a limitation affecting the construction of local roads and streets.

Interpretive Groups

Land capability classification: 1

Ecological site: Loamy Bottomland

Pasture management group: Loamy Bottomland

CoB—Coarsewood silt loam, 1 to 3 percent slopes, rarely flooded

Setting

Landform: Flood plain

Landscape position: Natural levees along drainageways within the Brazos River flood plain

Slope: Very gently sloping; convex surfaces

Shape of areas: Somewhat elongated and narrow

Size of areas: 20 to 100 acres

Typical Profile

Surface layer:

0 to 7 inches—brown, moderately alkaline silt loam

Subsoil:

7 to 13 inches—brown, moderately alkaline silt loam

13 to 24 inches—brown, moderately alkaline silt loam

24 to 46 inches—light brown, moderately alkaline very fine sandy loam

Underlying material:

46 to 65 inches—pink, moderately alkaline very fine sandy loam

65 to 80 inches—light brown, moderately alkaline very fine sandy loam

Soil Properties

Depth: Very deep

Drainage class: Well drained

Water table: None within a depth of 6 feet

Flooding: 1 to 5 times in 100 years; usually lasting less than 2 days

Runoff: Very low

Permeability of most restrictive layer within a depth of 60 inches: Moderately rapid

Available water capacity: Moderate

Root zone: Very deep
Natural soil fertility: High
Shrink-swell potential: Low
Hazard of water erosion: Moderate

Composition

Coarsewood soil and similar inclusions: 80 to 90 percent
Contrasting inclusions: 10 to 20 percent

Inclusions

Similar inclusions:

- The moderately permeable Weswood and Yahola soils in similar positions on flood plains

Contrasting inclusions:

- The moderately well drained, very slowly permeable Ships soils in the slightly lower positions on flood plains

Use and Management

Major land use: Cropland

Other land uses: Pasture and rangeland

Pasture

Major limitations:

- Seepage is a problem for livestock ponds, and pond construction is not recommended.

Minor limitations:

- Water erosion is a moderate hazard during seedbed preparation for improved grasses.
- The moderate available water capacity limits the growth of improved grasses during periods of drought.

Cropland

Major limitations: None

Minor limitations:

- Water erosion is a moderate hazard when this soil is cultivated.
- A compacted layer can form below the surface layer if the soil is tilled when wet.
- The moderate available water capacity limits the growth of crops during periods of drought.

Rangeland

Major limitations:

- Seepage is a problem for livestock ponds, and pond construction is not recommended.

Minor limitations:

- The moderate available water capacity limits the growth of native plants during periods of drought.

Urban development

Major limitations:

- Because of the hazard of flooding, this soil is unsuitable for dwellings and most other urban uses.

Minor limitations:

- The low soil strength is a limitation affecting the construction of local roads and streets.

Interpretive Groups

Land capability classification: 2e

Ecological site: Loamy Bottomland

Pasture management group: Loamy Bottomland

CrB—Crockett loam, 1 to 3 percent slopes

Setting

Landform: Upland

Landscape position: Broad ridges and side slopes

Slope: Very gently sloping; convex surfaces

Shape of areas: Irregular

Size of areas: 20 to 200 acres

Typical Profile

Surface layer:

0 to 7 inches—brown moderately acid loam

Subsoil:

7 to 15 inches—mottled red and brown, moderately acid clay

15 to 48 inches—light olive brown, olive brown, and brown neutral clay that has olive yellow mottles

48 to 55 inches—mottled yellow, light olive brown, and light yellowish brown slightly alkaline clay loam

Underlying material:

55 to 80 inches—light gray, slightly alkaline shale that has brownish yellow and yellow mottles

Soil Properties

Depth: Deep

Drainage class: Moderately well drained

Water table: None within a depth of 6 feet

Flooding: None

Runoff: Very high

Permeability of most restrictive layer within a depth of 60 inches: Very slow

Available water capacity: Moderate

Root zone: Deep

Natural soil fertility: Moderate

Shrink-swell potential: High

Hazard of water erosion: Moderate

Composition

Crockett soil and similar inclusions: 85 to 95 percent

Contrasting inclusions: 5 to 15 percent

Inclusions

Similar inclusions:

- The slowly permeable Benchley soils on the lower side slopes
- The well drained Edge soils on similar convex ridges and side slopes
- Tabor soils in the lower concave areas

Contrasting inclusions:

- Lufkin soils on flats and in depressions

Use and Management

Major land use: Pasture

Other land uses: Rangeland and cropland

Pasture

Major limitations:

- The very slow permeability restricts water movement and the root development of improved grasses.

Minor limitations:

- Water erosion is a moderate hazard during seedbed preparation for improved grasses.
- The moderate available water capacity limits the growth of improved grasses during periods of drought.

Cropland

Major limitations:

- The very slow permeability restricts water movement and the root development of crops.

Minor limitations:

- Water erosion is a moderate hazard when the soil is cultivated.
- The moderate available water capacity limits the growth of crops during periods of drought.

Rangeland

Major limitations:

- The very slow permeability restricts water movement and the root development of native plants.

Minor limitations:

- The moderate natural fertility limits the yield potential of native forage plants.
- The moderate available water capacity limits the growth of native plants during periods of drought.

Urban development

Major limitations:

- The high potential for shrinking and swelling can cause structural damage to residential and small commercial buildings.
- The shrink-swell potential and low soil strength are limitations affecting the construction of local roads and streets.
- The very slow permeability can interfere with the proper functioning of septic tank absorption fields.
- The risk of corrosion is high for uncoated steel.

Interpretive Groups

Land capability classification (nonirrigated areas): 3e

Ecological site: Claypan Prairie

Pasture management group: Loamy Claypan

CrC2—Crockett loam, 2 to 5 percent slopes, eroded

Setting

Landform: Upland

Distinctive landscape features: Eroded surface with subsoil exposed in spots; some areas have few rills and some shallow gullies

Soil Survey of Robertson County, Texas

Landscape position: Side slopes

Slope: Very gently sloping or gently sloping; convex surfaces

Shape of areas: Irregular

Size of areas: 10 to 200 acres

Typical Profile

Surface layer:

0 to 3 inches—dark brown, moderately acid loam that has strong brown mottles

Subsoil:

3 to 12 inches—brown, moderately acid clay that has reddish brown mottles

12 to 25 inches—grayish brown, slightly acid clay that has yellowish red and brown mottles

25 to 43 inches—grayish brown, slightly alkaline clay

43 to 52 inches—light olive gray, slightly alkaline clay

Underlying material:

52 to 80 inches—light gray, neutral shale

Soil Properties

Depth: Deep

Drainage class: Moderately well drained

Water table: None within a depth of 6 feet

Flooding: None

Runoff: Very high

Permeability of most restrictive layer within a depth of 60 inches: Very slow

Available water capacity: Moderate

Root zone: Deep

Natural soil fertility: Low

Shrink-swell potential: High

Hazard of water erosion: Severe

Composition

Crockett soil and similar inclusions: 85 to 95 percent

Contrasting inclusions: 5 to 15 percent

Inclusions

Similar inclusions:

- The well drained Edge soils in similar positions on side slopes

Contrasting inclusions:

- The well drained, moderately permeable Gasil soils on the lower side slopes

Use and Management

Major land use: Rangeland

Other land uses: Pasture

Pasture

Major limitations:

- Mechanical treatment may be needed in areas of rills and shallow gullies before establishing improved grasses.
- Because of the very slow permeability and the absence of a surface layer in some areas, water movement and the root development of improved grasses are restricted.

Minor limitations:

- The moderate available water capacity limits the growth of improved grasses during periods of drought.

Cropland

Major limitations:

- Because of the severe hazard of water erosion, this soil is poorly suited to growing crops.
- Mechanical treatment may be needed in areas of rills and shallow gullies before planting crops.
- Because of the very slow permeability and the absence of a surface layer in some areas, water movement and the root development of crops are restricted.

Minor limitations:

- The moderate available water capacity limits the growth of crops during periods of drought.

Rangeland

Major limitations:

- The low natural fertility, which is a result of the eroded surface layer, limits the yield potential of native plants.
- The very slow permeability restricts water movement and the root development of native plants.

Minor limitations:

- The low available water capacity limits the growth of native plants during periods of drought.

Urban development

Major limitations:

- The high potential for shrinking and swelling can cause structural damage to residential and small commercial buildings.
- The very slow permeability can interfere with the proper functioning of septic tank absorption fields.
- The shrink-swell potential and low soil strength are limitations affecting the construction of local roads and streets.
- The risk of corrosion is high for uncoated steel.

Interpretive Groups

Land capability classification (nonirrigated areas): 4e

Ecological site: Claypan Prairie

Pasture management group: Poorly Suited

DAM—Dam

This map unit consists of a barrier built across a waterway to control the flow or raise the level of water. It is not assigned any interpretive groups.

DfC—Desan loamy fine sand, 1 to 5 percent slopes

Setting

Landform: Stream terrace

Landscape position: Ridges and side slopes

Slope: Very gently sloping or gently sloping; convex surfaces

Soil Survey of Robertson County, Texas

Shape of areas: Elongated or irregular

Size of areas: 20 to 100 acres

Typical Profile

Surface layer:

0 to 10 inches—very pale brown, slightly acid loamy fine sand

Subsurface layer:

10 to 62 inches—slightly acid loamy fine sand; light brown in upper part and pink in lower part

Subsoil:

62 to 80 inches—red, slightly acid sandy clay loam

Soil Properties

Depth: Very deep

Drainage class: Somewhat excessively drained

Water table: None within a depth of 6 feet

Flooding: None

Runoff: Negligible

Permeability of most restrictive layer within a depth of 60 inches: Rapid

Available water capacity: Low

Root zone: Very deep

Natural soil fertility: Low

Shrink-swell potential: Low

Hazard of water erosion: Moderate

Composition

Desan soil and similar inclusions: 90 to 95 percent

Contrasting inclusions: 5 to 10 percent

Inclusions

Similar inclusions:

- The well drained Dutek soils on similar convex ridges and side slopes
- The rapidly permeable Eufaula soils in broad, smooth areas

Contrasting inclusions:

- The well drained Bastrop soils and the well drained Silawa soils on the slightly higher convex ridges

Use and Management

Major land use: Pasture

Other land uses: Rangeland

Pasture

Major limitations:

- The low available water capacity limits the growth of improved grasses during periods of drought.
- Seepage is a problem for livestock ponds, and pond construction is not recommended.

Minor limitations:

- Water erosion is a moderate hazard during seedbed preparation for improved grasses.

Cropland

Major limitations:

- The low available water capacity limits the growth of crops during periods of drought.

Minor limitations:

- Water erosion is a moderate hazard when this soil is cultivated.
- When dry, the soil is loose and provides poor traction for farm machinery.

Rangeland

Major limitations:

- The low available water capacity limits the growth of native plants during periods of drought.
- The low natural fertility limits the production of native plants.
- Seepage is a problem for livestock ponds, and pond construction is not recommended.

Urban development

Major limitations:

- Because of the sandy soil texture, effluent can seep into ground water when this soil is used for septic tank absorption fields.
- Excavation sidewalls are unstable because of the sandy soil texture.

Minor limitations:

- The risk of corrosion is moderate for uncoated steel and concrete.
- Because of the low available water capacity, establishing and maintaining lawn grasses and landscape plants is more difficult.

Interpretive Groups

Land capability classification (nonirrigated areas): 3e

Ecological site: Deep Sand

Pasture management group: Deep Sandy

DmB—Dimebox clay, 1 to 3 percent slopes

Setting

Landform: Upland

Distinctive landscape features: Gilgai microrelief in undisturbed areas

Landscape position: Broad, smooth ridges

Slope: Very gently sloping; convex surfaces

Shape of areas: Oval or irregular

Size of areas: 20 to 100 acres

Typical Profile

Surface layer:

0 to 20 inches—very dark gray, slightly acid clay

Subsoil:

20 to 43 inches—very dark gray, slightly acid clay

43 to 52 inches—very dark grayish brown, neutral clay

52 to 63 inches—light yellowish brown, slightly alkaline clay

63 to 71 inches—pale yellow, slightly alkaline clay that has yellowish brown mottles

Underlying material:

71 to 80 inches—pale yellow, slightly alkaline stratified shale and sandstone that have brownish yellow, dark yellowish brown, and olive brown mottles

Soil Properties

Depth: Very deep

Drainage class: Moderately well drained

Water table: None within a depth of 6 feet

Flooding: None

Runoff: Very high

Permeability of most restrictive layer within a depth of 60 inches: Very slow

Available water capacity: High

Root zone: Very deep

Natural soil fertility: High

Shrink-swell potential: Very high

Hazard of water erosion: Moderate

Composition

Dimebox soil and similar inclusions: 85 to 95 percent

Contrasting inclusions: 5 to 15 percent

Inclusions

Similar inclusions:

- Luling soils on similar broad ridges

Contrasting inclusions:

- The slowly permeable Benchley soils on the lower side slopes
- Crockett soils on the slightly lower ridgetops and upper side slopes

Use and Management

Major land use: Rangeland

Other land uses: Pasture and cropland

Pasture

Major limitations:

- The very slow permeability restricts water movement and the root development of improved grasses.

Minor limitations:

- Water erosion is a moderate hazard during seedbed preparation for improved grasses.
- The clayey surface layer requires a well prepared seedbed for the establishment of improved grasses.

Cropland

Major limitations:

- The very slow permeability restricts water movement and the root development of crops.

Minor limitations:

- Water erosion is a moderate hazard when this soil is cultivated.

Rangeland

Major limitations:

- The very slow permeability restricts water movement and the root development of native plants.

Urban development

Major limitations:

- The high potential for shrinking and swelling can cause structural damage to residential and small commercial buildings.
- The shrink-swell potential and low soil strength are limitations affecting the construction of local roads and streets.
- The very slow permeability can interfere with the proper functioning of septic tank absorption fields.
- Excavation sidewalls are unstable because of the clayey texture.
- The risk of corrosion is high for uncoated steel and concrete.

Interpretive Groups

Land capability classification (nonirrigated areas): 2e

Ecological site: Blackland

Pasture management group: Clayey

DuB—Dutek loamy fine sand, 1 to 3 percent slopes

Setting

Landform: Stream terrace

Landscape position: Convex ridges and upper side slopes

Slope: Very gently sloping; convex surfaces

Shape of areas: Elongated or oblong

Size of areas: 20 to 200 acres

Typical Profile

Surface layer:

0 to 7 inches—very pale brown, slightly acid loamy fine sand

Subsurface layer:

7 to 17 inches—light yellowish brown, moderately acid loamy fine sand

17 to 27 inches—very pale brown, slightly acid loamy fine sand

Subsoil:

27 to 51 inches—red, moderately acid sandy clay loam

51 to 58 inches—light red, moderately acid sandy clay loam

Underlying material:

58 to 80 inches—reddish yellow, moderately acid fine sandy loam

Soil Properties

Depth: Very deep

Drainage class: Well drained

Water table: None within a depth of 6 feet

Flooding: None

Runoff: Very low

Permeability of most restrictive layer within a depth of 60 inches: Moderate

Available water capacity: Low

Root zone: Very deep

Natural soil fertility: Low

Shrink-swell potential: Low

Hazard of water erosion: Slight

Composition

Dutek soil and similar inclusions: 85 to 95 percent

Contrasting inclusions: 5 to 15 percent

Inclusions

Similar inclusions:

- Bastrop soils on the slightly lower convex ridges
- Silawa soils on similar convex ridges

Contrasting inclusions:

- The somewhat excessively drained Desan soils on the lower footslopes
- The somewhat excessively drained, rapidly permeable Eufaula soils in the lower broad, smooth areas

Use and Management

Major land use: Pasture

Other land uses: Rangeland and cropland

Pasture

Major limitations:

- The low available water capacity limits the growth of improved grasses during periods of drought.
- Seepage is a problem for livestock ponds, and pond construction is not recommended.

Cropland

Major limitations:

- The low available water capacity limits the growth of crops during periods of drought.

Minor limitations:

- When dry, the surface layer is loose and provides poor traction for farm machinery.

Rangeland

Major limitations:

- The low available water capacity limits the growth of native plants during periods of drought.
- The low natural fertility limits the yield potential of native plants.
- Seepage is a problem for livestock ponds, and pond construction is not recommended.

Urban development

Major limitations:

- Because of the sandy soil texture, effluent can seep into ground water when the soil is used for septic tank absorption fields.
- Excavation sidewalls are unstable because of the sandy soil texture.

Minor limitations:

- The risk of corrosion is moderate for uncoated steel and concrete.

Interpretive Groups

Land capability classification (nonirrigated areas): 3s

Ecological site: Sandy

Pasture management group: Sandy Upland

DuD—Dutek loamy fine sand, 3 to 8 percent slopes

Setting

Landform: Stream terrace

Landscape position: Narrow ridges and side slopes

Slope: Gently sloping to moderately sloping; convex surfaces

Shape of areas: Elongated or irregular

Size of areas: 20 to 200 acres

Typical Profile

Surface layer:

0 to 6 inches—brown, moderately acid loamy fine sand

Subsurface layer:

6 to 22 inches—pale brown, slightly acid loamy fine sand

Subsoil:

22 to 33 inches—red, moderately acid sandy clay loam

33 to 58 inches—red, very strongly acid sandy clay loam

58 to 68 inches—light red, very strongly acid fine sandy loam

Underlying material:

68 to 80 inches—reddish yellow, very strongly acid loamy fine sand

Soil Properties

Depth: Very deep

Drainage class: Well drained

Water table: None within a depth of 6 feet

Flooding: None

Runoff: Low

Permeability of most restrictive layer within a depth of 60 inches: Moderate

Available water capacity: Low

Root zone: Very deep

Natural soil fertility: Low

Shrink-swell potential: Low

Hazard of water erosion: Moderate

Composition

Dutek soil and similar inclusions: 80 to 90 percent

Contrasting inclusions: 10 to 20 percent

Inclusions

Similar inclusions:

- Silawa soils in similar positions on side slopes

Contrasting inclusions:

- Bastrop soils on the lower convex ridges
- The somewhat excessively drained Desan soils on the lower footslopes
- The somewhat excessively drained, rapidly permeable Eufaula soils in the lower broad, smooth areas

Use and Management

Major land use: Pasture

Other land uses: Rangeland and cropland

Pasture

Major limitations:

- The low available water capacity limits the growth of improved grasses during periods of drought.
- Seepage is a problem for livestock ponds, and pond construction is not recommended.

Minor limitations:

- Water erosion is a moderate hazard during seedbed preparation for improved grasses.

Cropland

Major limitations:

- The low available water capacity limits the growth of crops during periods of drought.

Minor limitations:

- Water erosion is a moderate hazard when this soil is cultivated.

Rangeland

Major limitations:

- The low available water capacity limits the growth of native plants during periods of drought.
- The low natural fertility limits the yield potential of native plants.
- Seepage is a problem for livestock ponds, and pond construction is not recommended.

Urban development

Major limitations:

- Because of the sandy soil texture, effluent can seep into ground water when the soil is used for septic tank absorption fields.
- Excavation sidewalls are unstable because of the sandy soil texture.

Minor limitations:

- The risk of corrosion is moderate for uncoated steel and concrete.

Interpretive Groups

Land capability classification (nonirrigated areas): 3e

Ecological site: Sandy

Pasture management group: Sandy Upland

EdC—Edge fine sandy loam, 1 to 5 percent slopes

Setting

Landform: Upland

Landscape position: Ridgetops and side slopes

Slope: Very gently sloping or gently sloping; convex surfaces

Shape of areas: Irregular to elongated

Size of areas: 20 to 400 acres

Typical Profile

Surface layer:

0 to 4 inches—grayish brown, moderately acid fine sandy loam

Subsurface layer:

4 to 12 inches—very pale brown, moderately acid fine sandy loam

Subsoil:

12 to 34 inches—red and reddish yellow, very strongly acid clay that has brownish yellow mottles

34 to 46 inches—red, very strongly acid clay loam that has brownish yellow and light brownish gray mottles

46 to 50 inches—mottled light brownish gray, red, and brownish yellow, very strongly acid clay loam

Underlying material:

50 to 74 inches—very pale brown, strongly acid weakly cemented siltstone and sandstone

74 to 80 inches—stratified pale yellow, moderately acid siltstone and yellowish red and gray fine sandy loam

Soil Properties

Depth: Deep

Drainage class: Well drained

Water table: None within a depth of 6 feet

Flooding: None

Runoff: Very high

Permeability of most restrictive layer within a depth of 60 inches: Very slow

Available water capacity: Moderate

Root zone: Deep

Natural soil fertility: Low

Shrink-swell potential: High

Hazard of water erosion: Severe

Composition

Edge soil and similar inclusions: 80 to 90 percent

Contrasting inclusions: 10 to 20 percent

Inclusions

Similar inclusions:

- The moderately well drained Crockett soils on similar ridgetops and side slopes
- The moderately permeable Gasil soils on similar and slightly lower side slopes

Contrasting inclusions:

- The moderately well drained Lufkin soils in flats or concave areas
- The moderately well drained Rader soils in the lower concave areas
- The moderately well drained Tabor soils on the lower side slopes or in concave areas

Use and Management

Major land use: Rangeland (fig. 7)

Other land uses: Pasture and cropland

Pasture

Major limitations:

- Water erosion is a severe hazard during seedbed preparation for improved grasses.
- The very slow permeability restricts water movement and the root development of improved grasses.

Minor limitations:

- The moderate available water capacity limits the yield potential of improved grasses.



Figure 7.—Rangeland of the Claypan Savannah Ecological Site in an area of Edge fine sandy loam, 1 to 5 percent slopes.

Cropland

Major limitations:

- Water erosion is a severe hazard when this soil is cultivated.
- The very slow permeability restricts water movement and the root development of crops.

Minor limitations:

- The moderate available water capacity limits the growth of crops during periods of drought.

Rangeland

Major limitations:

- The very slow permeability restricts water movement and the root development of native plants.
- The low natural fertility limits the potential yield of native plants.

Minor limitations:

- The moderate available water capacity limits the growth of native plants during periods of drought.

Urban development

Major limitations:

- The high potential for shrinking and swelling can cause structural damage to residential and small commercial buildings.
- The very slow permeability can interfere with the proper functioning of septic tank absorption fields.

- The shrink-swell potential and low soil strength are limitations affecting the construction of local roads and streets.

Minor limitations:

- The risk of corrosion is moderate for uncoated steel and concrete.

Interpretive Groups

Land capability classification (nonirrigated areas): 4e

Ecological site: Claypan Savannah

Pasture management group: Loamy Claypan

EdC2—Edge fine sandy loam, 2 to 5 percent slopes, eroded

Setting

Landform: Upland

Distinctive landscape features: Eroded surface with subsoil exposed in spots; some areas have few rills and occasional shallow gullies

Landscape position: Upper and lower side slopes

Slope: Very gently sloping or gently sloping; convex surfaces

Shape of areas: Irregular to elongated

Size of areas: 20 to 400 acres

Typical Profile

Surface layer:

0 to 4 inches—brown, moderately acid fine sandy loam

Subsoil:

4 to 22 inches—red, very strongly acid clay that has brown, gray, and reddish yellow mottles in lower part

22 to 41 inches—light red, very strongly acid clay that has strong brown and gray mottles

41 to 47 inches—light gray, very strongly acid clay loam that has red and strong brown mottles

Underlying material:

47 to 80 inches—stratified light gray, strongly acid shale and siltstone with yellowish red and yellowish brown mottles

Soil Properties

Depth: Deep

Drainage class: Well drained

Water table: None within a depth of 6 feet

Flooding: None

Runoff: Very high

Permeability of most restrictive layer within a depth of 60 inches: Very slow

Available water capacity: Moderate

Root zone: Deep

Natural soil fertility: Low

Shrink-swell potential: High

Hazard of water erosion: Severe

Composition

Edge soil and similar inclusions: 80 to 90 percent

Contrasting inclusions: 10 to 20 percent



Figure 8.—Improved grasses are difficult to establish without major mechanical treatment in areas of inaccessible gullies. Edge fine sandy loam, 2 to 5 percent slopes, eroded, is in the background.

Inclusions

Similar inclusions:

- The moderately well drained Crockett soils in similar positions on side slopes

Contrasting inclusions:

- The moderately permeable Gasil soils on similar and slightly lower side slopes

Use and Management

Major land use: Rangeland

Other land uses: Pasture

Pasture

Major limitations:

- Water erosion is a severe hazard during seedbed preparation for improved grasses.
- Mechanical treatment may be needed in rill and shallow gully areas before establishing improved grasses (fig. 8).
- Because of the absence of a surface layer in some areas and the very slow permeability, water movement and the root development of improved grasses are restricted.

Minor limitations:

- The moderate available water capacity limits the growth of improved grasses during periods of drought.

Cropland

Major limitations:

- Because of the severe hazard of water erosion, this soil is poorly suited to growing crops.

Rangeland

Major limitations:

- Because of the absence of a surface layer in some areas and the very slow permeability, water movement and the root development of native plants are restricted.
- The low natural fertility limits the yield potential of native plants.

Minor limitations:

- The moderate available water capacity limits the growth of native plants during periods of drought.

Urban development

Major limitations:

- The high potential for shrinking and swelling can cause structural damage to residential and small commercial buildings.
- The very slow permeability can interfere with the proper functioning of septic tank absorption fields.
- The shrink-swell potential and low soil strength are limitations affecting the construction of local roads and streets.

Minor limitations:

- The risk of corrosion is moderate for uncoated steel and concrete.

Interpretive Groups

Land capability classification (nonirrigated areas): 4e

Ecological site: Claypan Savannah

Pasture management group: Poorly Suited

EdD2—Edge fine sandy loam, 5 to 8 percent slopes, eroded

Setting

Landform: Upland

Distinctive landscape features: Eroded surface with subsoil exposed in spots; some areas have few rills and few shallow gullies

Landscape position: Upper and lower side slopes

Slope: Moderately sloping; convex surfaces

Shape of areas: Irregular to elongated

Size of areas: 20 to 200 acres

Typical Profile

Surface layer:

0 to 4 inches—brown, strongly acid fine sandy loam

Subsoil:

4 to 24 inches—yellowish red, very strongly acid clay that has pale brown and light yellowish brown mottles

24 to 34 inches—red, strongly acid clay loam that has light yellowish brown mottles

Soil Survey of Robertson County, Texas

34 to 43 inches—very pale brown, moderately acid sandy clay loam that has yellowish red mottles

Underlying material:

43 to 64 inches—very pale brown, neutral, weakly cemented siltstone that has yellowish brown mottles

64 to 80 inches—very pale yellow, moderately acid, weakly cemented siltstone that has yellowish red and light gray mottles

Soil Properties

Depth: Deep

Drainage class: Well drained

Water table: None within a depth of 6 feet

Flooding: None

Runoff: Very high

Permeability of most restrictive layer within a depth of 60 inches: Very slow

Available water capacity: Moderate

Root zone: Deep

Natural soil fertility: Low

Shrink-swell potential: High

Hazard of water erosion: Severe

Composition

Edge soil and similar inclusions: 80 to 90 percent

Contrasting inclusions: 10 to 20 percent

Inclusions

Similar inclusions:

- The moderately well drained Crockett soils in the less sloping areas

Contrasting inclusions:

- The moderately permeable Gasil soils on similar and lower side slopes

Use and Management

Major land use: Rangeland

Other land uses: Pasture

Pasture

Major limitations:

- Water erosion is a severe hazard during seedbed preparation for improved grasses.
- Mechanical treatment may be needed in rill and shallow gully areas before establishing improved grasses.
- Because of the absence of a surface layer in some areas and the very slow permeability, water movement and the root development of improved grasses are restricted.

Minor limitations:

- The moderate available water capacity limits the growth of improved grasses during periods of drought.

Cropland

Major limitations:

- Because of the severe hazard of water erosion, this soil is unsuitable for growing crops.

Rangeland

Major limitations:

- Because of the absence of a surface layer in some areas and the very slow permeability, water movement and the root development of native plants are restricted.
- The low natural fertility limits the yield potential of native plants.

Minor limitations:

- The moderate available water capacity limits the growth of native plants during periods of drought.

Urban development

Major limitations:

- The high potential for shrinking and swelling can cause structural damage to residential and small commercial buildings.
- The very slow permeability can interfere with the proper functioning of septic tank absorption fields.
- The shrink-swell potential and low soil strength are limitations affecting the construction of local roads and streets.

Minor limitations:

- The risk of corrosion is moderate for uncoated steel and concrete.

Interpretive Groups

Land capability classification (nonirrigated areas): 6e

Ecological site: Claypan Savannah

Pasture management group: Not Suited

EgD—Edge-Gullied land complex, 3 to 8 percent slopes

Setting

Landform: Upland

Distinctive landscape features: Gullies are V-shaped and U-shaped, 5 to 20 feet deep and 20 to 200 feet wide, and range from several hundred feet to more than 0.5 mile in length. Areas of Edge soil are between gullies. Some gullies have wide, smooth to undulating bottoms that have accumulated sediment, which enables woody vegetation of mesquite trees, post oak, upland willows, cedar, and sparse areas of native grass to grow in the gully bottom.

Landscape position: Upper and lower side slopes

Slope: Gently sloping to moderately sloping; concave surfaces

Shape of areas: Elongated to irregular

Size of areas: 20 to 100 acres

Typical Profile

Edge

Surface layer:

0 to 5 inches—light yellowish brown, moderately acid fine sandy loam

Subsoil:

5 to 17 inches—red, slightly acid clay that has yellowish brown mottles

17 to 31 inches—light reddish brown, strongly acid clay that has red mottles

31 to 45 inches—light reddish brown, moderately acid clay that has olive yellow mottles

45 to 54 inches—light brownish gray, neutral clay loam

Underlying material:

54 to 80 inches—light gray, moderately alkaline shale

Gullied land

Underlying material:

0 to 80 inches—moderately alkaline, stratified grayish brown and light gray shale and brown sandstone

Properties of the Edge Soil

Depth: Deep

Drainage class: Well drained

Water table: None within a depth of 6 feet

Flooding: None

Runoff: Very high

Permeability of most restrictive layer within a depth of 60 inches: Very slow

Available water capacity: Very low

Root zone: Deep

Natural soil fertility: Low

Shrink-swell potential: High

Hazard of water erosion: Severe

Composition

Note: This Edge soil and Gullied land occur as areas so intricately mixed that mapping them separately was not practical.

Edge soil and similar inclusions: 40 to 65 percent

Gullied land: 30 to 40 percent

Contrasting inclusions: 5 to 20 percent

Inclusions

Similar inclusions:

- The moderately well drained Crockett soils on similar side slopes

Contrasting inclusions:

- The moderately permeable Gasil soils on the lower side slopes

Use and Management

Major land use: Rangeland

Other land uses: None

Pasture

Major limitations:

- Because water erosion is a severe hazard, this map unit is unsuitable for pasture.
- Because of the numerous, uncrossable gullies, establishing improved grasses is extremely difficult unless major mechanical treatment is completed first.

Cropland

Major limitations:

- Because water erosion is a severe hazard, this map unit is unsuitable for cropland.
- Numerous, uncrossable gullies prevent the use of any tillage equipment.

Rangeland

Major limitations:

- Because of the numerous, uncrossable gullies, the growth and grazing of native plants is severely limited and this map unit is poorly suited to rangeland.

Urban development

Major limitations:

- Because of the hazard of erosion and numerous, uncrossable gullies, this map unit is poorly suited to urban uses. Mechanical shaping, however, can reclaim some areas.
- The shrink-swell potential and low soil strength are limitations affecting the construction of local roads and streets.

Minor limitations:

- The risk of corrosion is moderate for uncoated steel and concrete.

Interpretive Groups

Land capability classification (nonirrigated areas): Edge—6e; Gullied land—7e

Ecological site: Edge—Claypan Savannah; Gullied land—none assigned

Pasture management group: Not Suited

EuC—Eufaula loamy fine sand, 1 to 5 percent slopes

Setting

Landform: Stream terrace

Landscape position: Broad, smooth areas

Slope: Very gently sloping or gently sloping; convex surfaces

Shape of areas: Elongated or irregular

Size of areas: 20 to 200 acres

Typical Profile

Surface layer:

0 to 7 inches—brown, moderately acid loamy fine sand

Subsurface layer:

7 to 15 inches—pale brown, moderately acid loamy fine sand

15 to 31 inches—very pale brown, moderately acid loamy fine sand

Subsoil:

31 to 80 inches—very pale brown, strongly acid loamy fine sand that has lamellae of strong brown fine sandy loam

Soil Properties

Depth: Very deep

Drainage class: Somewhat excessively drained

Water table: None within a depth of 6 feet

Flooding: None

Runoff: Negligible

Permeability of most restrictive layer within a depth of 60 inches: Rapid

Available water capacity: Low

Root zone: Very deep

Natural soil fertility: Low

Shrink-swell potential: Low

Hazard of water erosion: Moderate

Composition

Eufaula soil and similar inclusions: 80 to 90 percent

Contrasting inclusions: 10 to 20 percent



Figure 9.—Horses grazing on improved bermudagrass in an area of Eufaula loamy fine sand, 1 to 5 percent slopes.

Inclusions

Similar inclusions:

- Arenosa soils in the slightly higher positions on adjacent uplands
- The rapidly permeable Desan soils in similar and slightly higher convex areas
- The well drained, moderately permeable Padina soils in the slightly higher positions on adjacent uplands
- A soil similar to the Eufaula soil on slopes greater than 5 percent

Contrasting inclusions:

- The well drained, moderately permeable Dutek soils on similar and slightly higher convex ridges and side slopes
- The well drained, moderately permeable Silawa soils on the slightly higher convex ridges and side slopes

Use and Management

Major land use: Rangeland

Other land uses: Pastureland and cropland (fig. 9)

Pasture

Major limitations:

- The low available water capacity limits the growth of improved grasses during periods of drought.

- Because of the rapid permeability of the soil, there is a high rate of leaching and a more costly fertilization program is required.
- Seepage is a problem for livestock ponds, and construction is not recommended.

Minor limitations:

- Water erosion is a moderate hazard during seedbed preparation for improved grasses.

Cropland

Major limitations:

- Because of the low available water capacity, this soil poorly is suited to most crops. The soil, however, is suited to the production of watermelons and peanuts.

Minor limitations:

- Water erosion is a moderate hazard when this soil is cultivated.
- When dry, the soil is loose and provides poor traction for farm machinery.

Rangeland

Major limitations:

- The low available water capacity limits the growth of native plants during periods of drought.
- The low natural fertility limits the yield potential of native plants.
- Seepage is a problem for livestock ponds, and construction is not recommended.

Urban development

Major limitations:

- Because of the rapid permeability, effluents can seep into ground water when this soil is used for septic tank absorption fields.
- Excavation sidewalls are unstable because of the sandy soil texture.
- Because of the low available water capacity and rapid permeability, establishing and maintaining lawn grasses and other landscape plants is more difficult.

Interpretive Groups

Land capability classification (nonirrigated areas): 4s

Ecological site: Deep Sand

Pasture management group: Very Deep Sandy

**Ga—Gaddy loamy fine sand, 0 to 2 percent slopes,
frequently flooded**

Setting

Landform: Flood plain

Landscape position: Sand bars adjacent to the Brazos River

Slope: Nearly level; convex surfaces

Shape of areas: Elongated and narrow

Size of areas: 10 to 100 acres

Typical Profile

Surface layer:

0 to 9 inches—brown, slightly alkaline loamy fine sand

Underlying material:

9 to 38 inches—reddish yellow, moderately alkaline fine sand

38 to 57 inches—pink, moderately alkaline fine sand

Soil Survey of Robertson County, Texas

57 to 80 inches—pink, moderately alkaline fine sand that has thin strata of brown silty clay loam

Soil Properties

Depth: Very deep

Drainage class: Somewhat excessively drained

Water table: None within a depth of 6 feet

Flooding: More than 50 times in 100 years; lasting from about 2 to 7 days

Runoff: Negligible

Permeability: Moderately rapid or rapid

Available water capacity: Low

Root zone: Very deep

Natural soil fertility: Low

Shrink-swell potential: Low

Hazard of water erosion: Slight

Composition

Gaddy soil and similar inclusions: 85 to 95 percent

Contrasting inclusions: 5 to 15 percent

Inclusions

Similar inclusions:

- The well drained Coarsewood and Yahola soils in the slightly higher positions on flood plains

Contrasting inclusions:

- The well drained, moderately permeable Weswood soils in the slightly higher positions on flood plains

Use and Management

Major land use: Rangeland

Other land uses: Pasture

Pasture

Major limitations:

- The low available water capacity limits the growth of improved grasses during periods of drought.

Minor limitations:

- Flooding prohibits the use of mechanical equipment.
- Flooding can disrupt livestock grazing for brief periods.

Cropland

Major limitations:

- Because of the hazard of flooding, this soil is unsuitable for growing crops.

Rangeland

Major limitations:

- The low available water capacity limits the growth of native plants during periods of drought.
- The low natural fertility limits the yield potential of native plants.

Minor limitations:

- Flooding can disrupt livestock grazing for brief periods.

Urban development

Major limitations:

- Because of the hazard of flooding, this soil is unsuitable for dwellings and most other urban uses.
- Flooding is a limitation affecting the construction of local roads and streets.

Interpretive Groups

Land capability classification (nonirrigated areas): 5w

Ecological site: Sandy Bottomland

Pasture management group: Sandy Bottomland

GsB—Gasil loamy fine sand, 1 to 5 percent slopes

Setting

Landform: Upland

Landscape position: Ridgetops and side slopes

Slope: Very gently sloping or gently sloping; convex surfaces

Shape of areas: Irregular

Size of areas: 10 to 200 acres

Typical Profile

Surface layer:

0 to 7 inches—brown, moderately acid loamy fine sand

Subsurface layer:

7 to 15 inches—pale brown, moderately acid loamy fine sand

Subsoil:

15 to 26 inches—yellowish brown, strongly acid sandy clay loam that has strong brown mottles

26 to 44 inches—yellowish brown, moderately acid sandy clay loam that has yellowish red and red mottles

44 to 54 inches—brownish yellow, moderately acid sandy clay loam that has light brownish gray, red, and yellowish brown mottles

54 to 74 inches—mottled yellowish brown, red, and light gray, moderately acid sandy clay loam

74 to 80 inches—brownish yellow, moderately acid fine sandy loam that has red and light brownish gray mottles

Soil Properties

Depth: Very deep

Drainage class: Well drained

Water table: None within a depth of 6 feet

Flooding: None

Runoff: Low

Permeability: Moderate

Available water capacity: Moderate

Root zone: Very deep

Natural soil fertility: Moderate

Shrink-swell potential: Medium

Hazard of water erosion: Moderate

Composition

Gasil soil and similar inclusions: 85 to 95 percent

Contrasting inclusions: 5 to 15 percent

Inclusions

Similar inclusions:

- Silawa soils in the slightly lower positions on terraces
- Silstid soils in similar positions on ridgetops and side slopes
- A soil that is similar to the Gasil soil but that has a surface layer of fine sandy loam

Contrasting inclusions:

- The very slowly permeable Edge soils in the slightly higher positions on ridgetops and side slopes
- The slowly permeable Hearne soils on the higher ridgetops and side slopes
- The very slowly permeable Rader soils in the lower concave areas
- The very slowly permeable Tabor soils in the slightly lower broad, smooth areas

Use and Management

Major land use: Pasture

Other land uses: Rangeland and cropland

Pasture

Major limitations: None

Minor limitations:

- Water erosion is a moderate hazard during seedbed preparation for improved grasses.
- The moderate available water capacity limits the growth of improved grasses during periods of drought.

Cropland

Major limitations: None

Minor limitations:

- Water erosion is a moderate hazard when this soil is cultivated.
- The moderate available water capacity limits the growth of crops during periods of drought.

Rangeland

Major limitations: None

Minor limitations:

- The moderate available water capacity limits the growth of native plants during periods of drought.
- The moderate natural fertility limits the yield potential of native plants.

Urban development

Major limitations: None

Minor limitations:

- The shrink-swell potential and low soil strength are limitations affecting the construction of residential and small commercial buildings.

Interpretive Groups

Land capability classification (nonirrigated areas): 3e

Ecological site: Sandy Loam

Pasture management group: Sandy Upland

GsD—Gasil loamy fine sand, 5 to 8 percent slopes

Setting

Landform: Upland

Landscape position: Side slopes

Slope: Moderately sloping; convex surfaces

Shape of areas: Irregular to elongated

Size of areas: 20 to 200 acres

Typical Profile

Surface layer:

0 to 4 inches—light yellowish brown, moderately acid loamy fine sand

Subsurface layer:

4 to 11 inches—very pale brown, moderately acid loamy fine sand

Subsoil:

11 to 36 inches—brownish yellow, strongly acid sandy clay loam that has yellowish brown and red mottles

36 to 71 inches—very pale brown, strongly acid sandy clay loam that has red, light brownish gray, and brownish yellow mottles

71 to 80 inches—light yellowish brown, strongly acid sandy clay loam that has red, light brownish gray, and brownish yellow mottles

Soil Properties

Depth: Very deep

Drainage class: Well drained

Water table: None within a depth of 6 feet

Flooding: None

Runoff: Medium

Permeability: Moderate

Available water capacity: Moderate

Root zone: Very deep

Natural soil fertility: Moderate

Shrink-swell potential: Medium

Hazard of water erosion: Severe

Composition

Gasil soil and similar inclusions: 85 to 95 percent

Contrasting inclusions: 5 to 15 percent

Inclusions

Similar inclusions:

- Silstid soils in similar positions on side slopes
- A soil that is similar to the Gasil soil but that has a surface layer of fine sandy loam

Contrasting inclusions:

- The very slowly permeable Edge soils and the slowly permeable Hearne soils in similar positions on side slopes and in slightly higher positions on ridgetops

Use and Management

Major land use: Pasture

Other land uses: Rangeland and cropland

Pasture

Major limitations:

- Water erosion is a severe hazard during seedbed preparation for improved grasses.

Minor limitations:

- The moderate available water capacity limits the growth of improved grasses during periods of drought.

Cropland

Major limitations:

- Water erosion is a severe hazard when this soil is cultivated.

Minor limitations:

- The moderate available water capacity limits the growth of crops during periods of drought.

Rangeland

Major limitations: None

Minor limitations:

- The moderate available water capacity limits the growth of native plants during periods of drought.
- The moderate natural fertility limits the yield potential of native forage plants.

Urban development

Major limitations: None

Minor limitations:

- The shrink-swell potential, low soil strength, and slope are limitations affecting the construction of residential and small commercial buildings.

Interpretive Groups

Land capability classification (nonirrigated areas): 4e

Ecological site: Sandy Loam

Pasture management group: Sandy Upland

HaB—Hammond fine sandy loam, 1 to 3 percent slopes

Setting

Landform: Reclaimed strip-mined areas on uplands and terraces

Landscape position: Ridgetops and side slopes

Slope: Very gently sloping; broad, plane, or convex surfaces

Shape of areas: Irregular

Size of areas: 100 to 500 acres

Typical Profile

Surface layer:

0 to 8 inches—brown, neutral fine sandy loam

Underlying material:

8 to 13 inches—gray, slightly alkaline clay loam that has yellowish brown, brownish yellow, and gray mottles and remnants of native soil

13 to 36 inches—light yellowish brown, slightly alkaline clay loam that has brownish yellow, light gray, and dark grayish brown mottles

36 to 48 inches—light yellowish brown, slightly alkaline clay loam that has light gray and yellowish brown mottles

Soil Survey of Robertson County, Texas

48 to 60 inches—light gray, slightly alkaline clay loam that has yellowish brown and dark grayish brown mottles

60 to 80 inches—light yellowish brown, slightly alkaline clay loam that has brownish yellow and grayish brown mottles

Soil Properties

Depth: Very deep

Drainage class: Well drained

Water table: None within a depth of 6 feet

Flooding: None

Runoff: High

Permeability: Slow

Available water capacity: Moderate

Root zone: Very deep

Natural soil fertility: Low

Shrink-swell potential: Medium

Hazard of water erosion: Moderate

Composition

Hammond soil and similar inclusions: 85 to 95 percent

Contrasting inclusions: 5 to 15 percent

Inclusions

Similar inclusions:

- A soil similar to the Hammond soil except that it has more than 3 percent fragments of diagnostic soil horizons between depths of 10 and 40 inches

Contrasting inclusions:

- The very slowly permeable Crockett, Edge, and Padina soils and the moderately permeable Tabor soils in adjacent convex areas not disturbed by mining activities

Use and Management

Major land use: Pasture

Other land uses: Rangeland

Pasture

Major limitations:

- In order to produce high yields of improved grasses, a complete fertilization program is needed to offset the low natural fertility.

Minor limitations:

- Water erosion is a moderate hazard during seedbed preparation for improved grasses.
- The moderate available water capacity limits the growth of improved grasses during periods of drought.

Cropland

Major limitations:

- Because of the low fertility, this soil is poorly suited to cropland. A complete fertilization program is needed to overcome the limitation and produce high yields of some crops.

Minor limitations:

- Water erosion is a moderate hazard when this soil is cultivated.
- The moderate available water capacity limits the growth of crops during periods of drought.

Rangeland

Major limitations:

- In reclaimed areas, reseeding to native plants is needed after strip-mining activities.
- The low natural fertility limits the yield potential of native plants.

Minor limitations:

- The moderate available water capacity limits the growth of native plants during periods of drought.

Urban development

Major limitations:

- Because of unstable fill, this soil is poorly suited to the construction of residential and small commercial buildings.
- The slow permeability can interfere with the proper functioning of septic tank absorption fields.
- The low soil strength is a limitation affecting the construction of local roads and streets.

Minor limitations:

- The shrink-swell potential can cause structural damage to residential and small commercial buildings.
- The risk of corrosion is moderate for uncoated steel.

Interpretive Groups

Land capability classification (nonirrigated areas): 3e

Ecological site: None assigned

Pasture management group: Loamy Upland

HaE—Hammond fine sandy loam, 5 to 15 percent slopes

Setting

Landform: Reclaimed strip-mined soils on uplands and terraces

Landscape position: Upper and lower side slopes

Slope: Moderately sloping to moderately steep; convex surfaces

Shape of areas: Irregular to elongated

Size of areas: 10 to 100 acres

Typical Profile

Surface layer:

0 to 6 inches—brown, slightly alkaline fine sandy loam that has aggregates of reddish brown sandy clay loam

Underlying material:

6 to 60 inches—pale yellow, slightly alkaline clay loam that has brownish yellow and brown mottled aggregates along with few fragments of lignite, gray shale, and ironstone

60 to 72 inches—light gray, slightly alkaline clay loam that has few red mottles and fragments of shale

72 to 80 inches—pale yellow, slightly alkaline clay loam that has few red mottles and fragments of shale

Soil Properties

Depth: Very deep

Drainage class: Well drained

Water table: None within a depth of 6 feet

Flooding: None
Runoff: Very high
Permeability: Slow
Available water capacity: Moderate
Root zone: Very deep
Natural soil fertility: Low
Shrink-swell potential: Medium
Hazard of water erosion: Severe

Composition

Hammond soil and similar inclusions: 90 to 95 percent
Contrasting inclusions: 5 to 10 percent

Inclusions

Similar inclusions:

- A soil that is similar to the Hammond soil but that has more than 3 percent fragments of diagnostic soil horizons between depths of 10 and 40 inches

Contrasting inclusions:

- The very slowly permeable Crockett and Edge soils and the moderately permeable Padina soils in adjacent convex areas not disturbed by mining activities
- The very slowly permeable Tabor soils in adjacent concave areas not disturbed by mining activities

Use and Management

Major land use: Pasture

Other land uses: Rangeland

Pasture

Major limitations:

- Water erosion is a severe hazard during seedbed preparation for improved grasses.
- Because of low fertility, a complete fertilization program is needed for high yields of improved grasses.

Minor limitations:

- The moderate available water capacity limits the growth of improved grasses during periods of drought.

Cropland

Major limitations:

- Because of the slope and severe hazard of erosion, this soil is unsuitable for growing crops.

Rangeland

Major limitations:

- After strip-mining, reclaimed areas require reseeding to native plants.
- The low natural fertility limits the yield potential of native plants.

Minor limitations:

- The moderate available water capacity limits the growth of native plants during periods of drought.

Urban development

Major limitations:

- Because of the slope and unstable fill, this soil is poorly suited to the construction of residential and small commercial buildings.

- The slow permeability can interfere with the proper functioning of septic tank absorption fields.
- The low soil strength is limitation affecting the construction of local roads and streets.

Minor limitations:

- The shrink-swell potential is a limitation affecting the construction of residential and small commercial buildings.
- The risk of corrosion is moderate for uncoated steel.

Interpretive Groups

Land capability classification (nonirrigated areas): 6e

Ecological site: None assigned

Pasture management group: Poorly Suited

HeD—Hearne fine sandy loam, 3 to 8 percent slopes

Setting

Landform: Upland

Landscape position: Ridgetops and side slopes

Slope: Gently sloping to moderately sloping; convex surfaces

Shape of areas: Irregular to oval

Size of areas: 10 to 100 acres

Typical Profile

Surface layer:

0 to 7 inches—brown, strongly acid fine sandy loam

Subsurface layer:

7 to 10 inches—light brown, strongly acid fine sandy loam

Subsoil:

10 to 18 inches—red, extremely acid clay

18 to 25 inches—red, extremely acid clay that has grayish brown mottles

25 to 31 inches—red, extremely acid clay that is stratified with light brownish gray shale and yellowish red, weakly cemented sandstone

Underlying material:

31 to 37 inches—stratified red and yellowish red, extremely acid weakly cemented sandstone and light gray shale

37 to 72 inches—stratified brownish yellow and red, extremely acid weakly cemented sandstone and light gray shale

72 to 80 inches—stratified light gray and red, extremely acid shale and brownish yellow and yellow, weakly cemented sandstone

Soil Properties

Depth: Very deep

Drainage class: Well drained

Water table: None within a depth of 6 feet

Flooding: None

Runoff: Very high

Permeability: Slow

Available water capacity: Moderate

Root zone: Very deep

Natural soil fertility: Low

Shrink-swell potential: Medium

Hazard of water erosion: Severe

Composition

Hearne soil and similar inclusions: 80 to 90 percent

Contrasting inclusions: 10 to 20 percent

Inclusions

Similar inclusions:

- The moderately permeable Rosanky soils on the slightly higher, less sloping broad ridges
- A soil that is similar to the Hearne soil but that has a surface layer of loamy fine sand

Contrasting inclusions:

- The moderately permeable Gasil soils in the lower positions on side slopes
- The moderately permeable Padina and Silstid soils in the slightly higher broad, smooth areas
- The moderately well drained Robco soils in the lower, concave areas

Use and Management

Major land use: Rangeland

Other land uses: Pasture

Pasture

Major limitations:

- Water erosion is a severe hazard during seedbed preparation for improved grasses.
- The slow permeability restricts water movement and the root development of improved grasses.

Minor limitations:

- The moderate available water capacity limits the growth of improved grasses during periods of drought.

Cropland

Major limitations:

- Because of the severe hazard of water erosion, this soil is poorly suited to growing crops.

Rangeland

Major limitations:

- The slow permeability restricts water movement and the root development of native plants.
- The low natural fertility limits the yield potential of native plants.

Minor limitations:

- The moderate available water capacity limits the growth of native plants during periods of drought.

Urban development

Major limitations:

- The slow permeability can interfere with the proper functioning of septic tank absorption fields.
- The low soil strength is a limitation affecting the construction of local roads and streets.
- The risk of corrosion is high for uncoated steel and concrete.

Minor limitations:

- The shrink-swell potential can cause structural damage to residential and small commercial buildings.

Interpretive Groups

Land capability classification (nonirrigated areas): 4e

Ecological site: Sandy Loam

Pasture management group: Poorly Suited

HeE—Hearne fine sandy loam, 8 to 20 percent slopes

Setting

Landform: Upland

Landscape position: Narrow ridgetops and side slopes adjacent to drainageways

Slope: Strongly sloping to moderately steep; convex surfaces

Shape of areas: Elongated and narrow to irregular

Size of areas: 20 to 100 acres

Typical Profile

Surface layer:

0 to 5 inches—dark brown, strongly acid fine sandy loam

Subsoil:

5 to 13 inches—red, strongly acid clay

13 to 23 inches—red, extremely acid clay that has strong brown mottles

23 to 29 inches—mottled, red and light brownish gray, extremely acid clay

Underlying material:

29 to 80 inches—stratified light brownish gray, extremely acid shale and yellowish brown, weakly cemented sandstone

Soil Properties

Depth: Very deep

Drainage class: Well drained

Water table: None within a depth of 6 feet

Flooding: None

Runoff: Very high

Permeability: Slow

Available water capacity: Moderate

Root zone: Very deep

Natural soil fertility: Low

Shrink-swell potential: Medium

Hazard of water erosion: Severe

Composition

Hearne soil and similar inclusions: 85 to 95 percent

Contrasting inclusions: 5 to 15 percent

Inclusions

Similar inclusions:

- A soil that is similar to the Hearne soil in which the combined thickness of the surface and subsoil layers is less than 20 inches

Contrasting inclusions:

- The moderately permeable Padina soils in similar positions on side slopes

Use and Management

Major land use: Rangeland

Other land uses: Pasture

Pasture

Major limitations:

- Water erosion is a severe hazard during seedbed preparation for improved grasses.
- Because of the slope, the use of mechanical equipment for establishing improved grasses is limited.
- The slow permeability restricts water movement and the root development of improved grasses.

Minor limitations:

- The moderate available water capacity limits the growth of improved grasses during periods of drought.

Cropland

Major limitations:

- Because of the slope and severe hazard of water erosion, this soil is unsuitable for growing crops.

Rangeland

Major limitations:

- The low natural fertility limits the yield potential of native plants.
- The slow permeability restricts water movement and the root development of native plants.

Minor limitations:

- The moderate available water capacity limits the growth of native plants during periods of drought.

Urban development

Major limitations:

- The slope and slow permeability can interfere with the proper functioning of septic tank absorption fields.
- The slope and low soil strength are limitations affecting the construction of local roads and streets; the slope is also a limitation affecting the construction of residential and small commercial buildings.
- The risk of corrosion is high for uncoated steel and concrete.

Minor limitations:

- The shrink-swell potential is a limitation affecting the construction of residential and small commercial buildings.

Interpretive Groups

Land capability classification (nonirrigated areas): 6e

Ecological site: Sandy Loam

Pasture management group: Not Suited

HnD—Hearne fine sandy loam, 1 to 8 percent slopes, graded

Setting

Landform: Upland

Distinctive landscape features: Gravel pits

Landscape position: Ridgetops and upper side slopes

Soil Survey of Robertson County, Texas

Slope: Very gently sloping to moderately sloping; convex surfaces

Shape of areas: Oval to irregular

Size of areas: 5 to 20 acres

Typical Profile

Surface layer:

0 to 3 inches—reddish brown, strongly acid fine sandy loam

Subsoil:

3 to 17 inches—red, strongly acid clay that has reddish mottles

17 to 24 inches—red, strongly acid clay that has light brownish gray and brownish yellow mottles

Underlying material:

24 to 37 inches—stratified red, strongly acid shale and thin strata of weakly cemented sandstone

37 to 45 inches—stratified light gray, very strongly acid shale and thin strata of weakly cemented sandstone

45 to 80 inches—stratified reddish yellow, strongly acid sandstone and thin strata of red and gray shale

Soil Properties

Depth: Very deep

Drainage class: Well drained

Water table: None within a depth of 6 feet

Flooding: None

Runoff: Very high

Permeability: Slow

Available water capacity: Low

Root zone: Very deep

Natural soil fertility: Low

Shrink-swell potential: Medium

Hazard of water erosion: Severe

Composition

Hearne soil and similar inclusions: 90 to 95 percent

Contrasting inclusions: 5 to 10 percent

Inclusions

Similar inclusions:

- The moderately slowly permeable Rosanky soils on similar convex ridges and upper side slopes
- A soil that is similar to the Hearne soil except that the surface layer has not been graded
- Areas of boulders and stones of sandstone and ironstone that remain on the outer perimeters of graded sites

Contrasting inclusions:

- The moderately permeable Gasil soils on the lower side slopes

Use and Management

Major land use: Rangeland

Other land uses: Pasture

Pasture

Major limitations:

- The loss of the surface layer and low pH severely restrict the establishment and growth of improved grasses. Significant amounts of soil amendments and mulch are required.
- Water erosion is a severe hazard in areas that have been mined.

Cropland

Major limitations:

- Because of the severe hazard of water erosion and absence of a surface layer, this soil is unsuitable for growing crops.

Rangeland

Major limitations:

- Because of the low natural fertility and absence of a surface layer, the establishment and growth of native plants are severely restricted.
- Water erosion is a severe hazard in areas that have been mined.

Urban development

Major limitations:

- The slow permeability can interfere with the proper functioning of septic tank absorption fields.
- Because of the absence of a surface layer and a low pH, the establishment of lawns and landscaping plants is severely restricted.
- The low soil strength is a limitation affecting the construction of local roads and streets.
- The risk of corrosion is high for uncoated steel and concrete.

Minor limitations:

- The shrink-swell potential is a limitation affecting the construction of residential and small commercial buildings.

Interpretive Groups

Land capability classification (nonirrigated areas): 6e

Ecological site: Sandstone Hill

Pasture management group: Poorly Suited

HnE—Hearne fine sandy loam, 5 to 20 percent slopes, very stony

Setting

Landform: Upland

Distinctive landscape features: Fragments of sandstone and ironstone 10 to 48 inches in diameter cover 5 to 10 percent of the surface

Landscape position: Ridgetops and upper side slopes

Slope: Moderately sloping to moderately steep; convex surfaces

Shape of areas: Elongated to somewhat rounded

Size of areas: 10 to 150 acres

Typical Profile

Surface layer:

0 to 4 inches—dark brown, strongly acid fine sandy loam

Soil Survey of Robertson County, Texas

Subsurface layer:

4 to 13 inches—pinkish gray, strongly acid fine sandy loam

Subsoil:

13 to 24 inches—red, very strongly acid clay that has dark red mottles

24 to 29 inches—red, very strongly acid clay that has yellowish brown and dark yellowish brown mottles

29 to 36 inches—red, very strongly acid clay that has yellowish brown and pale brown mottles

Underlying material:

36 to 49 inches—stratified, extremely acid red and light brownish gray shale and brownish yellow clay loam

49 to 57 inches—stratified, extremely acid dark red and light brownish gray shale

57 to 80 inches—stratified, extremely acid red and light gray shale and yellowish brown clay loam

Soil Properties

Depth: Very deep

Drainage class: Well drained

Water table: None within a depth of 6 feet

Flooding: None

Runoff: Very high

Permeability: Slow

Available water capacity: Moderate

Root zone: Very deep

Natural soil fertility: Low

Shrink-swell potential: Medium

Hazard of water erosion: Severe

Composition

Hearne soil and similar inclusions: 85 to 95 percent

Contrasting inclusions: 5 to 15 percent

Inclusions

Similar inclusions:

- A soil that is similar to the Hearne soil but that has less than 5 percent stones on the surface

Contrasting inclusions:

- The moderately permeable Padina soils in the slightly higher, smooth, broad areas

Use and Management

Major land use: Rangeland

Other land uses: None

Pasture

Major limitations:

- Because of the slope and large stones on the surface, this soil is unsuitable for pasture.

Cropland

Major limitations:

- Because of a severe hazard of water erosion, the slope, and large stones on the surface, this soil is unsuitable for cropland.

Rangeland

Major limitations:

- Large stones on the surface restrict native plant growth and livestock grazing.
- The slow permeability limits water movement and the root development of native plants.
- The low natural fertility restricts the yields of native plants.

Minor limitations:

- The moderate available water capacity limits the yields of native plants during periods of drought.

Urban development

Major limitations:

- Because of the slope and large stones on the surface, the construction of residential and small commercial buildings is difficult.
- The slow permeability can interfere with the proper functioning of septic tank absorption fields.
- The low soil strength is a limitation affecting the construction of local roads and streets.
- The risk of corrosion is high for uncoated steel and concrete.

Minor limitations:

- The shrink-swell potential is a limitation affecting the construction of residential and small commercial buildings.

Interpretive Groups

Land capability classification (nonirrigated areas): 7e

Ecological site: Sandstone Hill

Pasture management group: Not Suited

HrD—Hearne gravelly fine sandy loam, 3 to 8 percent slopes

Setting

Landform: Upland

Landscape position: Ridgetops and upper side slopes

Slope: Gently sloping to moderately sloping; convex surfaces

Shape of areas: Oval to irregular

Size of areas: 5 to 50 acres

Typical Profile

Surface layer:

0 to 9 inches—reddish brown, strongly acid, gravelly fine sandy loam

Subsoil:

9 to 17 inches—red, strongly acid clay that has yellowish brown mottles

17 to 28 inches—red, strongly acid clay that has strong brown, gray, and red mottles

28 to 36 inches—red, very strongly acid clay that has partly weathered gray shale and yellowish brown sandstone and that has yellowish brown and red mottles

Underlying material:

36 to 51 inches—stratified red, very strongly acid shale that has light brownish gray mottles and strong brown and pale brown weakly cemented sandstone

51 to 80 inches—stratified reddish yellow, extremely acid, weakly cemented sandstone and red and light brownish gray shale

Soil Properties

Depth: Very deep
Drainage class: Well drained
Water table: None within a depth of 6 feet
Flooding: None
Runoff: Very high
Permeability: Slow
Available water capacity: Moderate
Root zone: Very deep
Natural soil fertility: Low
Shrink-swell potential: Medium
Hazard of water erosion: Severe

Composition

Hearne soil and similar inclusions: 85 to 95 percent
Contrasting inclusions: 5 to 15 percent

Inclusions

Similar inclusions:

- A soil that is similar to the Hearne soil but that has less than 15 percent gravel in the surface layer
- The moderately slowly permeable Rosanky soils on the lower convex ridges

Contrasting inclusions:

- The moderately permeable Gasil soils on the lower side slopes
- The moderately permeable Padina and Silstid soils in the slightly higher broad, smooth areas

Use and Management

Major land use: Rangeland

Other land uses: Pasture

Pasture

Major limitations:

- Water erosion is a severe hazard during seedbed preparation for improved grasses.
- The slow permeability restricts water movement and the root development of improved grasses.

Minor limitations:

- The moderate available water capacity limits the growth of improved grasses during periods of drought.

Cropland

Major limitations:

- Because of the severe hazard of water erosion, this soil is poorly suited to growing crops.
- The slow permeability restricts water movement and the root development of growing crops.

Minor limitations:

- The moderate available water capacity limits the growth of crops during periods of drought.
- Cultivation is difficult because of the gravelly surface layer.

Rangeland

Major limitations:

- The slow permeability restricts water movement and the root development of native plants.
- The low natural fertility limits the yield potential of native plants.

Minor limitations:

- The moderate available water capacity limits the growth of native plants during periods of drought.

Urban development

Major limitations:

- The slow permeability can interfere with the proper functioning of septic tank absorption fields.
- The low soil strength is a limitation affecting the construction of local roads and streets.
- The risk of corrosion is high for uncoated steel and concrete.

Minor limitations:

- The shrink-swell potential can cause structural damage to residential and small commercial buildings.
- Lawns and landscaping plants can be difficult to establish because of the gravelly surface layer.

Interpretive Groups

Land capability classification (nonirrigated areas): 4e

Ecological site: Sandy Loam

Pasture management group: Gravelly Loamy Claypan

HsA—Highbank silty clay loam, 0 to 1 percent slopes, rarely flooded

Setting

Landform: Flood plain

Landscape position: Broad areas within the flood plains of the Brazos River

Slope: Nearly level; plane surfaces

Shape of areas: Somewhat elongated to irregular

Size of areas: 10 to 200 acres

Typical Profile

Surface layer:

0 to 17 inches—brown, slightly alkaline silty clay loam

Subsoil:

17 to 80 inches—reddish brown and light reddish brown, slightly alkaline clay

Soil Properties

Depth: Very deep

Drainage class: Well drained

Water table: None within a depth of 6 feet

Flooding: 1 to 5 times in 100 years; for a period of less than 2 days

Runoff: Medium

Permeability: Slow

Available water capacity: High

Soil Survey of Robertson County, Texas

Root zone: Very deep
Natural soil fertility: High
Shrink-swell potential: High
Hazard of water erosion: Slight

Composition

Highbank soil and similar inclusions: 80 to 90 percent
Contrasting inclusions: 10 to 20 percent

Inclusions

Similar inclusions:

- The moderately permeable Weswood soils in similar positions on flood plains

Contrasting inclusions:

- The moderately rapidly permeable Coarsewood soils in similar positions on flood plains
- The somewhat poorly drained, very slowly permeable Roetex soils in concave areas on flood plains
- The moderately well drained, very slowly permeable Ships soils in similar or slightly lower positions on flood plains

Use and Management

Major land use: Cropland

Other land uses: Pasture and rangeland

Pasture

Major limitations: None

Minor limitations:

- The slow permeability restricts water movement and the root development of improved grasses.

Cropland

Major limitations: None

Minor limitations:

- The slow permeability restricts water movement and the root development of crops.
- If tillage operations are performed while the soil is wet, a compacted layer can form below the surface layer.

Rangeland

Major limitations: None

Minor limitations:

- The slow permeability restricts water movement and the root development of native plants.

Urban development

Major limitations:

- Because of the hazard of flooding, this soil is unsuitable for most dwellings and most other urban uses.
- The shrink-swell potential and low soil strength are limitations affecting the construction of local roads and streets.
- The risk of corrosion is high for uncoated steel.

Interpretive Groups

Land capability classification: 2s

Ecological site: Loamy Bottomland

Pasture management group: Loamy Bottomland

LeC—Lexton clay loam, 3 to 5 percent slopes

Setting

Landform: Upland

Landscape position: Ridgetops and side slopes

Slope: Gently sloping; convex surfaces

Shape of areas: Oblong to elongated

Size of areas: 20 to 100 acres

Typical Profile

Surface layer:

0 to 6 inches—reddish brown, slightly acid clay loam

Subsoil:

6 to 11 inches—yellowish red, slightly acid clay

11 to 31 inches—red, strongly acid clay

31 to 47 inches—strong brown and yellowish red, moderately acid clay that has light olive brown mottles

47 to 55 inches—strong brown, slightly acid clay that has red mottles and fragments of partly weathered glauconitic material

Underlying material:

55 to 64 inches—pale yellow, slightly alkaline shale that has fragments of partly weathered glauconite

64 to 80 inches—very pale brown, slightly alkaline fine sand

Soil Properties

Depth: Very deep

Drainage class: Well drained

Water table: None within a depth of 6 feet

Flooding: None

Runoff: Medium

Permeability: Moderately slow

Available water capacity: High

Root zone: Deep

Natural soil fertility: High

Shrink-swell potential: High

Hazard of water erosion: Severe

Composition

Lexton soil and similar inclusions: 80 to 90 percent

Contrasting inclusions: 10 to 20 percent

Inclusions

Similar inclusions:

- The moderately well drained, slowly permeable Benchley soils in the lower positions on side slopes
- The moderately slowly permeable Margie soils on convex ridges

Contrasting inclusions:

- The very slowly permeable Luling soils on similar convex ridges and side slopes

Use and Management

Major land use: Rangeland

Other land uses: Pasture and cropland

Pasture

Major limitations:

- Water erosion is a severe hazard during seedbed preparation for improved grasses.

Minor limitations:

- The moderately slow permeability restricts water movement and the root development of improved grasses.

Cropland

Major limitations:

- Water erosion is a severe hazard when this soil is cultivated.

Minor limitations:

- The moderately slow permeability restricts water movement and the root development of crops.

Rangeland

Major limitations: None

Minor limitations:

- The moderately slow permeability restricts water movement and the root development of native plants.

Urban development

Major limitations:

- The high potential for shrinking and swelling can cause structural damage to residential and small commercial buildings.
- The low soil strength is a limitation affecting the construction of local roads and streets.
- The risk of corrosion is high for uncoated steel.

Minor limitations:

- The moderately slow permeability can interfere with the proper functioning of septic tank absorption fields.

Interpretive Groups

Land capability classification (nonirrigated areas): 3e

Ecological site: Deep Redland

Pasture management group: Clayey

LeE—Lexton clay loam, 5 to 12 percent slopes

Setting

Landform: Upland

Landscape position: Side slopes above drainageways

Slope: Moderately sloping or strongly sloping; convex surfaces

Shape of areas: Elongated and narrow

Size of areas: 20 to 200 acres

Typical Profile

Surface layer:

0 to 5 inches—reddish brown, slightly acid clay loam

Soil Survey of Robertson County, Texas

Subsoil:

5 to 18 inches—reddish brown, moderately acid clay

18 to 35 inches—red, moderately acid clay

35 to 52 inches—yellowish red, slightly acid clay

Underlying material:

52 to 80 inches—brownish yellow, moderately alkaline clay loam that has strata of light gray glauconitic sandstone

Soil Properties

Depth: Very deep

Drainage class: Well drained

Water table: None within a depth of 6 feet

Flooding: None

Runoff: High

Permeability: Moderately slow

Available water capacity: High

Root zone: Very deep

Natural soil fertility: High

Shrink-swell potential: High

Hazard of water erosion: Severe

Composition

Lexton soil and similar inclusions: 80 to 90 percent

Contrasting inclusions: 10 to 20 percent

Inclusions

Similar inclusions:

- The slowly permeable Hearne soils in similar positions on side slopes
- A soil that is similar to the Lexton soil but that has large fragments of ironstone and sandstone on the surface

Contrasting inclusions:

- The very slowly permeable Luling soils on the slightly higher, broad convex ridges

Use and Management

Major land use: Rangeland

Other land uses: Pasture

Pasture

Major limitations:

- Water erosion is a severe hazard during seedbed preparation for improved grasses.

Minor limitations:

- The moderately slow permeability restricts water movement and the root development of improved grasses.

Cropland

Major limitations:

- Because of the slope and severe hazard of water erosion, this soil is unsuitable for growing crops.

Rangeland

Major limitations:

- Overgrazing by livestock can cause serious erosion problems.

Minor limitations:

- The moderately slow permeability restricts water movement and the root development of native plants.

Urban development

Major limitations:

- The slope and the high potential for shrinking and swelling can cause structural damage to residential and small commercial buildings.
- The low soil strength is a limitation affecting the construction of local roads and streets.
- The risk of corrosion is high for uncoated steel.

Minor limitations:

- The moderately slow permeability can interfere with the proper functioning of septic tank absorption fields.

Interpretive Groups

Land capability classification (nonirrigated areas): 6e

Ecological site: Deep Redland

Pasture management group: Clayey

LfA—Lufkin loam, 0 to 1 percent slopes

Setting

Landform: Stream terrace

Landscape position: Nearly level flats or slightly concave areas

Slope: Nearly level; plane to slightly concave surfaces

Shape of areas: Oval to oblong

Size of areas: 10 to 40 acres

Typical Profile

Surface layer:

0 to 4 inches—light brownish gray, strongly acid loam that has yellowish brown mottles

Subsurface layer:

4 to 9 inches—light gray, strongly acid loam that has brownish yellow mottles

Subsoil:

9 to 18 inches—light brownish gray, very strongly acid clay loam that has brown mottles

18 to 33 inches—light brownish gray, very strongly acid clay that has brown mottles

33 to 46 inches—light brownish gray, slightly acid clay

46 to 80 inches—light brownish gray to light gray, moderately acid clay that has dark grayish brown and yellowish brown mottles

Soil Properties

Depth: Very deep

Drainage class: Moderately well drained

Water table: Soil is seasonally wet; surface layer and upper part of subsoil are saturated during winter and spring for 14 to 30 days in most years

Flooding: None

Runoff: Negligible

Permeability: Very slow

Available water capacity: High

Root zone: Very deep



Figure 10.—Livestock grazing on common bermudagrass in an area of Lufkin loam, 0 to 1 percent slopes.

Natural soil fertility: Low

Shrink-swell potential: High

Hazard of water erosion: Slight

Composition

Lufkin soil and similar inclusions: 90 to 95 percent

Contrasting inclusions: 5 to 10 percent

Inclusions

Similar inclusions:

- Tabor soils in similar and slightly higher positions on terraces
- Wilson soils in similar positions on nearly level terraces

Contrasting inclusions:

- Bremond soils in the slightly higher positions on terraces
- Rader soils in similar and slightly higher positions on terraces

Use and Management

Major land use: Rangeland (fig. 10)

Other land uses: Pasture

Pasture

Major limitations:

- The very slow permeability restricts water movement and the root development of improved grasses.

Minor limitations:

- Seasonal wetness can limit areas grazed by livestock.

Cropland

Major limitations:

- The very slow permeability restricts water movement and the root development of crops.
- Seasonal wetness can hinder plant germination and limit tillage operations to dry periods.
- Because the surface layer is massive and hard when dry, tillage operations are difficult.

Rangeland

Major limitations:

- The very slow permeability restricts water movement and the root development of native plants.
- The low natural fertility limits the yield potential of native plants.
- Seasonal wetness can disrupt livestock grazing.

Urban development

Major limitations:

- The high potential for shrinking and swelling can result in structural damage to residential and small commercial buildings.
- The low soil strength, shrink-swell potential, and wetness are limitations affecting the construction of local roads and streets.
- The very slow permeability can interfere with the proper functioning of septic tank absorption fields.
- The risk of corrosion is high for uncoated steel.

Interpretive Groups

Land capability classification (nonirrigated areas): 3w

Ecological site: Claypan Savannah

Pasture management group: Seasonally Wet Loamy Claypan

LuB—Luling clay, 1 to 3 percent slopes

Setting

Landform: Upland

Distinctive landscape features: Gilgai microrelief in undisturbed areas

Landscape position: Broad ridgetops and upper side slopes

Slope: Very gently sloping; convex surfaces

Shape of areas: Oblong or irregular

Size of areas: 100 to 500 acres

Typical Profile

Surface layer:

0 to 13 inches—grayish brown, neutral clay

Subsoil:

13 to 35 inches—dark grayish brown clay that is neutral in upper part and slightly alkaline in lower part

35 to 43 inches—grayish brown, slightly alkaline clay

43 to 52 inches—light olive brown, slightly alkaline clay

52 to 64 inches—light yellowish brown, slightly alkaline clay that has thin strata of weathered shale

Soil Survey of Robertson County, Texas

Underlying material:

64 to 80 inches—light yellowish brown, slightly alkaline weathered shale that has yellowish brown mottles

Soil Properties

Depth: Very deep

Drainage class: Well drained

Water table: None within a depth of 6 feet

Flooding: None

Runoff: Very high

Permeability: Very slow

Available water capacity: High

Root zone: Very deep

Natural soil fertility: High

Shrink-swell potential: Very high

Hazard of water erosion: Moderate

Composition

Luling soil and similar inclusions: 85 to 95 percent

Contrasting inclusions: 5 to 15 percent

Inclusions

Similar inclusions:

- The moderately well drained Dimebox soils on similar ridgetops and in areas on upper side slopes

Contrasting inclusions:

- The moderately well drained Benchley soils on the lower side slopes adjacent to small drainageways
- The moderately well drained Crockett soils on similar convex ridges

Use and Management

Major land use: Pasture

Other land uses: Rangeland and cropland

Pasture

Major limitations:

- The very slow permeability restricts water movement and the root development of improved grasses.

Minor limitations:

- Water erosion is a moderate hazard during seedbed preparation for improved grasses.
- The clayey surface layer requires a well prepared seedbed for the establishment of improved grasses.

Cropland

Major limitations:

- The very slow permeability restricts water movement and the root development of crops.

Minor limitations:

- Water erosion is a moderate hazard when this soil is cultivated.
- The clayey surface layer is more difficult to till when the soil is too wet or too dry.

Rangeland

Major limitations:

- The very slow permeability restricts water movement and the root development of native plants.

Urban development

- The high potential for shrinking and swelling can cause structural damage to residential and small commercial buildings.
- The low soil strength and shrink-swell potential are limitations affecting the construction of local roads and streets.
- The very slow permeability can interfere with the proper functioning of septic tank absorption fields.
- Excavation sidewalls are unstable because of the clayey texture.
- The risk of corrosion is high for uncoated steel.

Interpretive Groups

Land capability classification (nonirrigated areas): 2e

Ecological site: Blackland

Pasture management group: Clayey

LuC—Luling clay, 3 to 5 percent slopes

Setting

Landform: Upland

Distinctive landscape features: Linear gilgai microrelief in undisturbed areas

Landscape position: Side slopes above drainageways

Slope: Gently sloping; convex surfaces

Shape of areas: Oblong or irregular

Size of areas: 50 to 200 acres

Typical Profile

Surface layer:

0 to 8 inches—dark grayish brown, slightly acid clay

Subsoil:

8 to 17 inches—dark grayish brown, moderately acid clay

17 to 40 inches—dark olive gray, strongly acid clay

40 to 62 inches—light olive brown, neutral clay that has brownish yellow mottles

Underlying material:

62 to 80 inches—neutral, olive yellow shale

Soil Properties

Depth: Very deep

Drainage class: Well drained

Water table: None within a depth of 6 feet

Flooding: None

Runoff: Very high

Permeability: Very slow

Available water capacity: High

Root zone: Very deep

Natural soil fertility: High

Shrink-swell potential: Very high

Hazard of water erosion: Severe

Composition

Luling soil and similar inclusions: 85 to 95 percent

Contrasting inclusions: 5 to 15 percent

Inclusions

Similar inclusions:

- A soil that is similar to the Luling soil; on slopes of more than 5 percent

Contrasting inclusions:

- The moderately well drained Benchley soil in the lower positions on side slopes along drainageways
- The moderately well drained Crockett soils in similar positions on side slopes

Use and Management

Major land use: Rangeland

Other land uses: Pasture and cropland

Pasture

Major limitations:

- Water erosion is a severe hazard during seedbed preparation for improved grasses.
- The very slow permeability restricts water movement and the root development of improved grasses.

Minor limitations:

- The clayey surface layer requires a well prepared seedbed for the establishment of improved grasses.

Cropland

Major limitations:

- Water erosion is a severe hazard when this soil is cultivated.
- The very slow permeability restricts water movement and the root development of crops.

Minor limitations:

- The clayey surface layer is more difficult to till when the soil is too wet or too dry.

Rangeland

Major limitations:

- The very slow permeability restricts water movement and the root development of native plants.

Minor limitations:

- Overgrazing by livestock can cause serious erosion problems.

Urban development

Major limitations:

- The high potential for shrinking and swelling can cause structural damage to residential and small commercial buildings.
- The low soil strength and shrink-swell potential are limitations affecting the construction of local roads and streets.
- The very slow permeability can interfere with the proper functioning of septic tank absorption fields.
- Excavation sidewalls are unstable because of the clayey texture.
- The risk of corrosion is high for uncoated steel.

Interpretive Groups

Land capability classification (nonirrigated areas): 3e

Ecological site: Blackland

Pasture management group: Clayey

MgB—Margie fine sandy loam, 1 to 3 percent slopes

Setting

Landform: Upland

Landscape position: Broad, smooth ridgetops

Slope: Very gently sloping; convex surfaces

Shape of areas: Irregular

Size of areas: 20 to 200 acres

Typical Profile

Surface layer:

0 to 6 inches—strong brown, moderately acid fine sandy loam

Subsoil:

6 to 10 inches—yellowish red, slightly acid sandy clay loam

10 to 28 inches—red, neutral clay loam

28 to 66 inches—yellowish red, slightly acid clay that has red mottles

66 to 72 inches—yellowish brown, slightly acid clay loam that has brownish yellow and reddish brown mottles and brown, partly weathered glauconitic material

Underlying material:

72 to 80 inches—stratified, neutral partly weathered glauconitic material, yellowish brown weakly cemented sandstone, and dark reddish brown shale

Soil Properties

Depth: Very deep

Drainage class: Well drained

Water table: None within a depth of 6 feet

Flooding: None

Runoff: Medium

Permeability: Moderately slow

Available water capacity: Moderate

Root zone: Very deep

Natural soil fertility: Moderate

Shrink-swell potential: Medium

Hazard of water erosion: Moderate

Composition

Margie soil and similar inclusions: 80 to 90 percent

Contrasting inclusions: 10 to 20 percent

Inclusions

Similar inclusions:

- The slowly permeable Hearne soils in the slightly higher positions on ridgetops
- Lexton soils in similar positions on ridgetops
- Rosanky soils on slightly higher, broad smooth ridges

Contrasting inclusions:

- The moderately permeable Gasil soils in the lower positions on side slopes
- The very slowly permeable Luling soils in the slightly lower broad, smooth areas
- The moderately permeable Silstid soils in the higher broad, smooth areas

Use and Management

Major land use: Pasture

Other land uses: Rangeland and cropland

Pasture

Major limitations: None

Minor limitations:

- Water erosion is a moderate hazard during seedbed preparation for improved grasses.
- The moderately slow permeability restricts water movement and the root development of improved grasses.
- The moderate available water capacity limits the yield potential of improved grasses during periods of drought.

Cropland

Major limitations: None

Minor limitations:

- Water erosion is a moderate hazard when this soil is cultivated.
- The moderately slow permeability restricts water movement and the root development of crops.
- The moderate available water capacity limits the yield potential of crops during periods of drought.

Rangeland

Major limitations: None

Minor limitations:

- The moderate natural fertility limits the yield potential of native plants.
- The moderately slow permeability restricts water movement and the root development of native plants.
- The moderate available water capacity limits the yield potential of native plants during periods of drought.

Urban development

Major limitations:

- The low soil strength is a limitation affecting the construction of local roads and streets.
- The risk of corrosion is high for uncoated steel.

Minor limitations:

- The shrink-swell potential can cause structural damage to residential and small commercial buildings.
- The moderately slow permeability can interfere with the proper functioning of septic tank absorption fields.

Interpretive Groups

Land capability classification (nonirrigated areas): 2e

Ecological site: Deep Redland

Pasture management group: Loamy Upland

Na—Navasota clay, 0 to 1 percent slopes, frequently flooded

Setting

Landform: Flood plain

Distinctive landscape features: Gilgai microrelief in undisturbed areas

Landscape position: Broad, smooth areas within the Navasota River flood plain and its tributaries

Slope: Nearly level; plane to slightly concave surfaces

Shape of areas: Elongated or irregular

Size of areas: 20 to 300 acres

Typical Profile

Surface layer:

0 to 7 inches—gray, moderately acid clay that has strong brown and gray mottles

Subsoil:

7 to 18 inches—light brownish gray, moderately acid clay that has yellowish brown and strong brown mottles

18 to 47 inches—light brownish gray, moderately acid clay that has strong brown and gray mottles

47 to 80 inches—light brownish gray, moderately acid clay that has brown and gray mottles

Soil Properties

Depth: Very deep

Drainage class: Somewhat poorly drained

Water table: A seasonal high water table is at a depth of 1.0 to 2.5 feet; mainly from October to May

Flooding: More than 50 times in 100 years; for a period of 7 to 14 days

Runoff: Very high

Permeability: Very slow

Available water capacity: High

Root zone: Very deep

Natural soil fertility: High

Shrink-swell potential: High

Hazard of water erosion: Slight

Composition

Navasota soil and similar inclusions: 80 to 90 percent

Contrasting inclusions: 10 to 20 percent

Inclusions

Similar inclusions:

- The moderately well drained Zilaboy soils in the slightly higher positions on flood plains
- A soil that is similar to the Navasota soil but that it is in small depressional areas

Contrasting inclusions:

- The moderately slowly permeable Oletha soils in similar positions on flood plains
- The moderately well drained, very slowly permeable Sandow soils in the slightly higher positions on flood plains
- The moderately well drained, moderately slowly permeable Uhland soils in the slightly higher positions on flood plains

Use and Management

Major land use: Rangeland

Other land uses: Pasture

Pasture

Major limitations:

- The very slow permeability restricts water movement and the root development of improved grasses.

Minor limitations:

- Wetness limits the use of mechanical equipment when the water table is high or when flooding occurs.
- Flooding can disrupt livestock grazing for long periods.

Cropland

Major limitations:

- Because of the hazard of flooding, this soil is unsuitable for growing crops.

Rangeland

Major limitations:

- The very slow permeability restricts water movement and the root development of native plants.

Minor limitations:

- Flooding can disrupt livestock grazing for brief periods.

Urban development

Major limitations:

- Because of the hazard of flooding, this soil is unsuitable for dwellings and most other urban uses.
- The low soil strength, the flooding, and the shrink-swell potential are limitations affecting the construction of local roads and streets.
- The risk of corrosion is high for uncoated steel.

Interpretive Groups

Land capability classification (nonirrigated areas): 5w

Ecological site: Clayey Bottomland

Pasture management group: Not Suited

Nd—Navasota clay, 0 to 1 percent slopes, depressional

Setting

Landform: Flood plain

Distinctive landscape features: Areas are 5 to 12 inches lower than surrounding soil

Landscape position: Depressional areas within broad, smooth areas

Slope: Nearly level; concave surfaces

Shape of areas: Elongated or irregular

Size of areas: 5 to 275 acres

Typical Profile

Surface layer:

0 to 11 inches—gray, moderately acid clay that has strong brown mottles

Soil Survey of Robertson County, Texas

Subsoil:

11 to 26 inches—gray, very strongly acid clay that has dark brown and strong brown mottles

26 to 38 inches—light brownish gray, very strongly acid clay that has yellowish brown mottles

38 to 61 inches—light gray, very strongly acid clay that has yellowish brown mottles

61 to 80 inches—light gray, very strongly acid clay that has strong brown mottles

Soil Properties

Depth: Very deep

Drainage class: Somewhat poorly drained

Water table: Soil has seasonal ponding 1 to 2.5 feet deep or a water table at a depth of 1.5 to 2.5 feet; mainly from October to May

Flooding: More than 50 times in 100 years; for a period of 14 to 30 days

Runoff: Negligible

Permeability: Very slow

Available water capacity: High

Root zone: Very deep

Natural soil fertility: High

Shrink-swell potential: High

Hazard of water erosion: Slight

Composition

Navasota soil and similar inclusions: 85 to 95 percent

Contrasting inclusions: 5 to 15 percent

Inclusions

Similar inclusions:

- A soil that is similar to the Navasota soil but that is in slightly higher positions and is adjacent to depressional areas
- The moderately well drained Zilaboy soils in the slightly higher positions on flood plains

Contrasting inclusions:

- The moderately slowly permeable Oletha soils in the slightly higher positions on flood plains
- The moderately well drained, moderately slowly permeable Sandow and Uhland soils in the higher positions on flood plains

Use and Management

Major land use: Rangeland

Other land uses: None

Pasture

Major limitations:

- Because of prolonged periods of wetness, establishing and maintaining improved grasses is difficult.

Minor limitations:

- The wetness limits the use of any type of mechanical equipment except during periods of drought.

Cropland

Major limitations:

- Because of the hazard of flooding, this soil is unsuitable for cropland.

Rangeland

Major limitations:

- Because of long-duration flooding and prolonged wetness, this soil is poorly suited to rangeland.

Urban development

Major limitations:

- Because of the hazard of flooding and prolonged wetness, this soil is unsuitable for dwellings and most other urban uses.
- The low soil strength, flooding, prolonged periods of wetness, and shrink-swell potential are limitations affecting the construction of local roads and streets.
- The risk of corrosion is high for uncoated steel.

Interpretive Groups

Land capability classification (nonirrigated areas): 6w

Ecological site: Clayey Bottomland

Pasture management group: Not Suited

Ot—Oletha clay, 0 to 1 percent slopes, frequently flooded

Setting

Landform: Flood plain

Landscape position: Broad, smooth areas adjacent to local streams

Slope: Nearly level; plane to weakly undulating surfaces

Shape of areas: Elongated or irregular

Size of areas: 20 to 300 acres

Typical Profile

Surface layer:

0 to 6 inches—dark gray, strongly acid clay

Subsoil:

6 to 14 inches—grayish brown, strongly acid sandy clay loam that has dark yellowish brown mottles

14 to 39 inches—grayish brown, strongly acid sandy clay loam that has strong brown and yellowish brown mottles

39 to 50 inches—gray, strongly acid sandy clay loam that has grayish brown and yellowish brown mottles

50 to 72 inches—gray, strongly acid sandy clay loam that has yellowish brown and dark gray mottles

72 to 80 inches—light brownish gray, slightly acid fine sandy loam that has yellowish brown and gray mottles

Soil Properties

Depth: Very deep

Drainage class: Somewhat poorly drained

Water table: A seasonal high water table is at a depth of 2.5 to 4 feet from November to May

Flooding: More than 50 times in 100 years; for a period of 2 to 7 days

Runoff: High

Permeability: Very slow

Available water capacity: High

Soil Survey of Robertson County, Texas

Root zone: Very deep
Natural soil fertility: High
Shrink-swell potential: High
Hazard of water erosion: Slight

Composition

Oletha soil and similar inclusions: 80 to 90 percent
Contrasting inclusions: 10 to 20 percent

Inclusions

Similar inclusions:

- The moderately well drained Sandow and Uhland soils in the slightly higher positions on flood plains

Contrasting inclusions:

- Navasota soils in similar and slightly lower positions on flood plains
- The moderately well drained Zilaboy soils in similar and slightly higher positions on flood plains

Use and Management

Major land use: Rangeland

Other land uses: Pasture

Pasture

Major limitations: None

Minor limitations:

- Seasonal wetness can delay the planting of improved grasses.
- Soil wetness limits the use of mechanical equipment when the water table is high or when flooding occurs.
- Flooding can disrupt grazing by livestock for brief periods.

Cropland

Major limitations:

- Because of the hazard of flooding, this soil is unsuitable for growing crops.

Rangeland

Major limitations: None

Minor limitations:

- Flooding can disrupt grazing by livestock for brief periods.

Urban development

Major limitations:

- Because of the hazard of flooding, this soil is unsuitable for dwellings and most other urban uses.
- The low soil strength and flooding are limitations affecting the construction of local roads and streets.
- The risk of corrosion is high for uncoated steel.

Interpretive Groups

Land capability classification (nonirrigated areas): 5w

Ecological site: Clayey Bottomland

Pasture management group: Clayey Bottomland

PaC—Padina loamy fine sand, 1 to 5 percent slopes

Setting

Landform: Upland

Landscape position: Broad, smooth ridges and side slopes

Slope: Very gently sloping or gently sloping; convex surfaces

Shape of areas: Elongated or irregular

Size of areas: 20 to 500 acres

Typical Profile

Surface layer:

0 to 5 inches—brown, neutral loamy fine sand

Subsurface layer:

5 to 56 inches—very pale brown, slightly acid loamy fine sand

Subsoil:

56 to 61 inches—light brownish gray, strongly acid sandy clay loam that has reddish yellow mottles

61 to 74 inches—light gray, strongly acid sandy clay loam that has red and yellowish brown mottles

74 to 80 inches—light gray, strongly acid fine sandy loam that has red mottles

Soil Properties

Depth: Very deep

Drainage class: Well drained

Water table: None within a depth of 6 feet

Flooding: None

Runoff: Negligible

Permeability: Moderate

Available water capacity: Low

Root zone: Very deep

Natural soil fertility: Low

Shrink-swell potential: Low

Hazard of water erosion: Moderate

Composition

Padina soil and similar inclusions: 80 to 95 percent

Contrasting inclusions: 5 to 20 percent

Inclusions

Similar inclusions:

- The somewhat excessively drained, rapidly permeable Arenosa soils in similar and slightly higher positions in broad, smooth areas
- The somewhat excessively drained, rapidly permeable Eufaula soils in the lower positions on terraces
- Silstid soils in similar broad, smooth areas

Contrasting inclusions:

- The poorly drained Cadelake soils in narrow drainageways and in lower concave areas
- The very slowly permeable Edge soils in similar positions on adjacent geologic formations
- The slowly permeable Hearne soils on the higher ridgetops

- The moderately well drained Robco soils in the lower positions on side slopes
- The moderately slowly permeable Rosanky soils on the higher ridgetops

Use and Management

Major land use: Rangeland

Other land uses: Pasture and cropland

Pasture

Major limitations:

- Water erosion is a moderate hazard during seedbed preparation for improved grasses.
- The low available water capacity limits the growth of improved grasses during periods of drought.
- Seepage is a problem for livestock ponds, and pond construction is not recommended.
- The combination of low fertility, low pH, and leaching requires a more costly fertilization and liming program if yields are to remain at high levels.

Cropland

Major limitations:

- Because of the droughtiness and low available water capacity, this soil is poorly suited to most crops. The soil, however, is suited to the production of watermelons and peanuts.

Minor limitations:

- Water erosion is a moderate hazard when this soil is cultivated.
- When dry, the soil is loose and provides poor traction for farm machinery.

Rangeland

Major limitations:

- The low available water capacity limits the growth of native plants during periods of drought.
- The low natural fertility limits the yield potential of native forage plants.
- Seepage is a problem for livestock ponds, and pond construction is not recommended.

Urban development

Major limitations:

- Because of the sandy texture, this soil is a poor filter and effluent can seep into ground water when the soil is used for septic tank absorption fields.
- Excavation sidewalls are unstable because of the sandy soil texture.
- The risk of corrosion is high for uncoated steel.
- Because of the droughtiness and the low available water capacity, establishing and maintaining lawns and landscaping plants is more difficult.

Interpretive Groups

Land capability classification (nonirrigated areas): 3e

Ecological site: Deep Sand

Pasture management group: Deep Sandy

PaE—Padina loamy fine sand, 5 to 15 percent slopes

Setting

Landform: Upland

Landscape position: Narrow ridgetops and side slopes

Soil Survey of Robertson County, Texas

Slope: Moderately sloping to moderately steep; convex surfaces

Shape of areas: Irregular or elongated

Size of areas: 20 to 300 acres

Typical Profile

Surface layer:

0 to 5 inches—pale brown, moderately acid loamy fine sand

Subsurface layer:

5 to 53 inches—very pale brown, moderately acid loamy fine sand

Subsoil:

53 to 66 inches—reddish yellow, strongly acid sandy clay loam that has light gray, brownish yellow, and red mottles

66 to 80 inches—light gray, strongly acid sandy clay loam that has brownish yellow, red, and yellowish red mottles

Soil Properties

Depth: Very deep

Drainage class: Well drained

Water table: None within a depth of 6 feet

Flooding: None

Runoff: Very low

Permeability: Moderate

Available water capacity: Low

Root zone: Very deep

Natural soil fertility: Low

Shrink-swell potential: Low

Hazard of water erosion: Severe

Composition

Padina soil and similar inclusions: 80 to 85 percent

Contrasting inclusions: 15 to 20 percent

Inclusions

Similar inclusions:

- The somewhat excessively drained, rapidly permeable Arenosa soils in similar positions on side slopes
- Silstid soils in similar positions on side slopes
- A soil that is similar to the Padina soil but that is on slopes of more than 15 percent

Contrasting inclusions:

- The poorly drained Cadelake soils in narrow drainageways and lower concave areas
- The slowly permeable Hearne soils in similar positions on side slopes and on higher ridgetops
- The moderately well drained Robco soils in the lower positions on side slopes

Use and Management

Major land use: Rangeland

Other land uses: Pasture

Pasture

Major limitations:

- Water erosion is a severe hazard during seedbed preparation for improved grasses.
- The low available water capacity limits the growth of improved grasses during periods of drought.

- The combination of low fertility, low pH, and leaching requires a more costly fertilization and liming program if yields are to be maintained at a high level.
- Seepage is a problem for livestock ponds, and pond construction is not recommended.

Minor limitations:

- Because of the slope and the loose, sandy surface layer, establishing improved grasses through tillage operations is difficult.

Rangeland

Major limitations:

- The low available water capacity limits the growth of native plants during periods of drought.
- The low natural fertility limits the yield potential of native forage plants.
- Seepage is a problem for livestock ponds, and pond construction is not recommended.

Minor limitations:

- Overgrazing by livestock can cause serious erosion problems.

Cropland

Major limitations:

- Because of the slope and the severe hazard of water erosion, this soil is unsuitable for growing crops.

Urban development

Major limitations:

- Because of the sandy texture, this soil is a poor filter and effluent can seep into ground water when the soil is used for septic tank absorption fields.
- Excavation sidewalls are unstable because of the sandy soil texture.
- The risk of corrosion is high for uncoated steel.
- The slope is a limitation affecting the construction of small commercial buildings.

Minor limitations:

- The slope is a limitation affecting the construction of residential buildings and local roads and streets.

Interpretive Groups

Land capability classification (nonirrigated areas): 6e

Ecological site: Deep Sand

Pasture management group: Deep Sandy

Pt—Pits and Dumps

This map unit consists of areas where the soil and the underlying strata have been removed and then used as sources of crushed rock, gravel, clay, or sand for road bases, building foundations, or embankments. With the exception of some sand and gravel pits near the Little Brazos and Brazos Rivers, most of the pits in Robertson County are ironstone and sandstone pits.

The pits range in depth from about 2 to 10 feet and range from about 5 to 100 acres in size. The largest pits used for sand and gravel are west of Hearne and adjacent to the Little Brazos River. Some pits used for surface gravel are shallower than those used for clay or rock material. The deeper pits have steep, vertical walls and are more difficult to reclaim. Some pits hold water seasonally.

The dumps are the large mounds of spoil material, which are adjacent to the pits. These dumps are extremely variable in texture and content. They range in height from

3 to 50 feet and in length from a few feet to a few hundred feet. Some mounds are composed mainly of loose, fine sand. The largest mound of sand in the county is west of Hearne near the Little Brazos River.

Some mounds are clayey in texture while others have large amounts of silt particles. Some spoil areas have large ironstone and sandstone rocks and boulders ranging from 2 to 5 feet in diameter. These dumps typically range from 5 to 20 feet in height. A few range to as much as 30 or 40 feet in height.

No interpretive groups are assigned to this map unit.

RaA—Rader fine sandy loam, 0 to 2 percent slopes

Setting

Landform: Stream terraces and relict Pleistocene terraces on uplands

Landscape position: Footslopes and head of drainageways

Slope: Nearly level; concave or plane surfaces

Shape of areas: Oval or irregular

Size of areas: 20 to 100 acres

Typical Profile

Surface layer:

0 to 8 inches—yellowish brown, slightly acid fine sandy loam

Subsurface layer:

8 to 14 inches—dark yellowish brown, slightly acid fine sandy loam

14 to 21 inches—very pale brown, slightly acid fine sandy loam that has yellowish brown mottles

Subsoil:

21 to 24 inches—light yellowish brown, slightly acid loam that has brownish yellow and reddish yellow mottles coated with very pale brown, slightly acid fine sandy loam

24 to 49 inches—light brownish gray, strongly acid clay loam that has reddish yellow and red mottles

49 to 65 inches—mottled gray, brownish yellow, and red, neutral clay

65 to 80 inches—gray, moderately alkaline clay that has yellowish red mottles

Soil Properties

Depth: Very deep

Drainage class: Moderately well drained

Water table: A seasonal water table is at a depth of 2 to 4 feet; mainly from December to March

Flooding: None

Runoff: High

Permeability: Very slow

Available water capacity: Moderate

Root zone: Very deep

Natural soil fertility: Moderate

Shrink-swell potential: High

Hazard of water erosion: Moderate

Composition

Rader soil and similar inclusions: 85 to 95 percent

Contrasting inclusions: 5 to 15 percent



Figure 11.—A pond in an area of Rader fine sandy loam, 0 to 2 percent slopes, provides water for livestock.

Inclusions

Similar inclusions:

- Tabor soils and the slowly permeable Robco soils in similar positions in concave or plane areas

Contrasting inclusions:

- The well drained, moderately permeable Gasil soils in the slightly higher positions on side slopes
- Lufkin soils on flats and in slightly concave areas

Use and Management

Major land use: Pasture

Other land uses: Rangeland and cropland (fig. 11)

Pasture

Major limitations:

- The very slow permeability restricts water movement and the root development of improved grasses.

Minor limitations:

- Erosion is a moderate hazard during seedbed preparation for improved grasses.
- The moderate available water capacity limits the growth of improved grasses during periods of drought.

Cropland

Major limitations:

- The very slow permeability restricts water movement and the root development of crops.

Minor limitations:

- Erosion is a moderate hazard when this soil is cultivated.
- The moderate available water capacity limits the growth of crops during periods of drought.

Rangeland

Major limitations:

- The very slow permeability restricts water movement and the root development of native plants.

Minor limitations:

- The moderate available water capacity limits the growth of native plants during periods of drought.
- The moderate natural fertility limits the yield potential of native forage plants.

Urban development

Major limitations:

- The very slow permeability and seasonal wetness can interfere with the proper functioning of septic tank absorption fields.
- The risk of corrosion is high for uncoated steel.

Minor limitations:

- The shrink-swell potential and seasonal wetness are limitations affecting the construction of residential and small commercial buildings.
- The seasonal wetness is a limitation affecting the construction of local roads and streets.

Interpretive Groups

Land capability classification (nonirrigated areas): 2e

Ecological site: Sandy Loam

Pasture management group: Loamy Claypan

RoB—Robco loamy fine sand, 1 to 3 percent slopes

Setting

Landform: Upland

Landscape position: Lower side slopes and head of drainageways

Slope: Very gently sloping; concave surfaces

Shape of areas: Somewhat elongated to irregular

Size of areas: 20 to 200 acres

Typical Profile

Surface layer:

0 to 8 inches—pale brown, moderately acid loamy fine sand

Subsurface layer:

8 to 16 inches—brown, slightly acid loamy fine sand

16 to 29 inches—very pale brown, moderately acid loamy fine sand

Subsoil:

29 to 34 inches—light yellowish brown, moderately acid sandy clay loam that has tongues of light brownish gray loamy fine sand

34 to 40 inches—light gray, moderately acid sandy clay loam that has yellowish brown mottles

40 to 54 inches—light yellowish brown, moderately acid clay that has yellowish brown and gray mottles

Soil Survey of Robertson County, Texas

54 to 64 inches—light gray, moderately acid clay loam that has brownish yellow and strong brown mottles

64 to 80 inches—light gray, slightly acid clay loam that has yellowish brown and brown mottles

Soil Properties

Depth: Very deep

Drainage class: Moderately well drained

Water table: A seasonal water table is at a depth of 1.5 to 3.5 feet; mainly from January to April

Flooding: None

Runoff: Very high

Permeability: Slow

Available water capacity: Moderate

Root zone: Very deep

Natural soil fertility: Low

Shrink-swell potential: Medium

Hazard of water erosion: Slight

Composition

Robco soil and similar inclusions: 80 to 90 percent

Contrasting inclusions: 10 to 20 percent

Inclusions

Similar inclusions:

- The very slowly permeable Rader soils in similar positions on concave and lower side slopes
- The well drained, moderately permeable Silstid soils in the slightly higher broad, smooth areas
- A soil that is similar to the Robco soil; on slopes of more than 3 percent

Contrasting inclusions:

- The poorly drained, rapidly permeable Cadelake soils in poorly defined narrow drainageways
- The well drained, moderately permeable Padina soils in the higher broad, smooth areas

Use and Management

Major land use: Pasture

Other land uses: Rangeland and cropland

Pasture

Major limitations: None

Minor limitations:

- The moderate available water capacity limits plant growth during periods of drought.

Cropland

Major limitations: None

Minor limitations:

- The moderate available water capacity limits the growth of some crops during periods of drought.
- When dry, the surface layer is loose and provides poor traction for farm machinery.

Rangeland

Major limitations:

- The low natural fertility limits the yield potential of native plants.

Minor limitations:

- The moderate available water capacity limits the growth of native plants during periods of drought.

Urban development

Major limitations:

- The slow permeability and seasonal wetness can interfere with the proper functioning of septic tank absorption fields.
- Excavation sidewalls are unstable because of the sandy soil texture.
- The risk of corrosion is high for uncoated steel and concrete.

Minor limitations:

- The shrink-swell potential and seasonal wetness are limitations affecting the construction of residential and small commercial buildings.
- The seasonal wetness is a limitation affecting the construction of local roads and streets.

Interpretive Groups

Land capability classification (nonirrigated areas): 2e

Ecological site: Sandy

Pasture management group: Sandy Upland

Rr—Roetex clay, 0 to 1 percent slopes, frequently flooded

Setting

Landform: Flood plain

Distinctive landscape features: Gilgai microrelief in undisturbed areas

Landscape position: Swales and depressions within the flood plain of the Brazos River

Slope: Nearly level; concave surfaces

Shape of areas: Elongated and oval

Size of areas: 10 to 100 acres

Typical Profile

Surface layer:

0 to 17 inches—reddish brown, moderately alkaline clay that has yellowish red mottles in the lower part

Subsoil:

17 to 35 inches—reddish gray, moderately alkaline clay that has gray mottles

35 to 42 inches—reddish brown, moderately alkaline clay that has yellowish red and dark gray mottles

42 to 55 inches—brown, moderately alkaline clay that has dark gray and yellowish red mottles

55 to 80 inches—mottled reddish brown and brown, moderately alkaline clay

Soil Properties

Depth: Very deep

Drainage class: Somewhat poorly drained

Water table: A seasonal water table is at a depth of 0.5 foot to 2.0 feet; mainly from October to May

Soil Survey of Robertson County, Texas

Flooding: More than 50 times in 100 years; for a period of 7 to more than 30 days

Runoff: Negligible

Permeability: Very slow

Available water capacity: High

Root zone: Very deep

Natural soil fertility: High

Shrink-swell potential: Very high

Hazard of water erosion: Slight

Composition

Roetex soil and similar inclusions: 90 to 95 percent

Contrasting inclusions: 5 to 10 percent

Inclusions

Similar inclusions:

- The moderately well drained Ships soils in the slightly higher positions on flood plains

Contrasting inclusions:

- The well drained, slowly permeable Highbank soils and the well drained, moderately permeable Weswood soils in the slightly higher positions on flood plains

Use and Management

Major land use: Rangeland

Other land uses: Pasture and cropland

Pasture

Major limitations:

- Because of long-duration flooding, this soil is poorly suited to improved grasses.

Cropland

Major limitations:

- Because of the long-duration flooding, this soil is unsuitable for growing crops.

Rangeland

Major limitations:

- Because of the long-duration wetness, this soil is poorly suited to rangeland.
- The very slow permeability restricts water movement and the root development of native plants.

Urban development

Major limitations:

- Because of the hazard of flooding, this soil is unsuitable for dwellings and most other urban uses.
- The shrink-swell potential, low soil strength, and wetness are limitations affecting the construction of local roads and streets.

Interpretive Groups

Land capability classification (nonirrigated areas): 7w

Ecological site: Clayey Bottomland

Pasture management group: Not Suited

RsC—Rosanky fine sandy loam, 2 to 5 percent slopes

Setting

Landform: Upland

Landscape position: Ridgetops and upper side slopes

Slope: Very gently sloping or gently sloping; convex surfaces

Shape of areas: Irregular

Size of areas: 20 to 100 acres

Typical Profile

Surface layer:

0 to 7 inches—yellowish brown, strongly acid fine sandy loam

Subsoil:

7 to 39 inches—red, strongly acid clay that has strong brown mottles in the lower part

39 to 47 inches—red, strongly acid clay loam that has brownish yellow mottles

Underlying material:

47 to 64 inches—mottled red, light brownish gray, and brownish yellow strongly acid clay loam that has thin strata of weakly cemented sandstone

64 to 71 inches—mottled brownish yellow, reddish yellow, light gray, and red strongly acid fine sandy loam

71 to 80 inches—stratified, strongly acid, brownish yellow, weakly cemented sandstone and light brownish gray sandy clay loam that have brownish yellow and red mottles

Soil Properties

Depth: Very deep

Drainage class: Well drained

Water table: None within a depth of 6 feet

Flooding: None

Runoff: Medium

Permeability: Moderately slow

Available water capacity: Moderate

Root zone: Very deep

Natural soil fertility: Low

Shrink-swell potential: Medium

Hazard of water erosion: Moderate

Composition

Rosanky soil and similar inclusions: 80 to 90 percent

Contrasting inclusions: 10 to 20 percent

Inclusions

Similar inclusions:

- The slowly permeable Hearne soils on the higher ridgetops and side slopes
- A soil that is similar to the Rosanky soil but that has a surface layer of loamy fine sand

Contrasting inclusions:

- The moderately permeable Gasil soils on the lower side slopes
- The moderately permeable Padina and Silstid soils in the higher broad, smooth areas

Use and Management

Major land use: Rangeland

Other land uses: Pasture and cropland

Pasture

Major limitations: None

Minor limitations:

- Water erosion is a moderate hazard during seedbed preparation for improved grasses.
- The moderately slow permeability restricts water movement and the root development of improved grasses.
- The moderate available water capacity limits the growth of improved grasses during periods of drought.

Cropland

Major limitations: None

Minor limitations:

- Water erosion is a moderate hazard when this soil is cultivated.
- The moderately slow permeability restricts water movement and the root development of crops.
- The moderate available water capacity limits the growth of crops during periods of drought.

Rangeland

Major limitations:

- The low natural fertility limits the yield potential of native plants.

Minor limitations:

- The moderately slow permeability restricts water movement and the root development of native plants.
- The moderate available water capacity limits the growth of native plants during periods of drought.

Urban development

Major limitations:

- The moderately slow permeability of the subsoil can interfere with the proper functioning of septic tank absorption fields.
- The low soil strength is a limitation affecting the construction of local roads and streets.
- The risk of corrosion is high for uncoated steel.

Minor limitations:

- The shrink-swell potential is a limitation affecting the construction of residential and small commercial buildings.

Interpretive Groups

Land capability classification (nonirrigated areas): 3e

Ecological site: Sandy Loam

Pasture management group: Loamy Upland

RsD—Rosanky fine sandy loam, 5 to 8 percent slopes

Setting

Landform: Upland

Landscape position: Side slopes

Soil Survey of Robertson County, Texas

Slope: Moderately sloping; convex surfaces

Shape of areas: Irregular

Size of areas: 10 to 40 acres

Typical Profile

Surface layer:

0 to 6 inches—brown, slightly acid fine sandy loam

Subsoil:

6 to 26 inches—red, moderately acid clay that has yellowish brown mottles

26 to 36 inches—red, moderately acid clay

36 to 45 inches—red, strongly acid clay that has small fragments of light gray shale

Underlying material:

45 to 62 inches—stratified, very strongly acid, very pale brown sandy clay loam and yellowish red fine sandy loam

62 to 80 inches—stratified reddish yellow, strongly acid, weakly cemented sandstone and yellowish red fine sandy loam

Soil Properties

Depth: Very deep

Drainage class: Well drained

Water table: None within a depth of 6 feet

Flooding: None

Runoff: High

Permeability: Moderately slow

Available water capacity: Moderate

Root zone: Very deep

Natural soil fertility: Low

Shrink-swell potential: Medium

Hazard of water erosion: Severe

Composition

Rosanky soil and similar inclusions: 85 to 95 percent

Contrasting inclusions: 5 to 15 percent

Inclusions

Similar inclusions:

- The slowly permeable Hearne soils in similar positions on side slopes

Contrasting inclusions:

- The moderately permeable Gasil soils on the lower side slopes
- The moderately permeable Padina and Silstid soils in the higher broad, smooth areas

Use and Management

Major land use: Rangeland

Other land uses: Pasture

Pasture

Major limitations:

- Water erosion is a severe hazard during seedbed preparation for improved grasses.

Minor limitations:

- The moderately slow permeability restricts water movement and the root development of improved grasses.

- The moderate available water capacity limits the yield potential of improved grasses during periods of drought.

Cropland

Major limitations:

- Because of the severe hazard of water erosion, this soil is unsuitable for cropland.

Rangeland

Major limitations:

- The low natural fertility limits the yield potential of native plants.

Minor limitations:

- The moderately slow permeability restricts water movement and the root development of native plants.
- The moderate available water capacity limits the yield potential of native plants during periods of drought.

Urban development

Major limitations:

- The moderately slow permeability can interfere with the proper functioning of septic tank absorption fields.
- The low soil strength is a limitation affecting the construction of local roads and streets.
- The risk of corrosion is high for uncoated steel.

Minor limitations:

- The shrink-swell potential and the slope are limitations affecting the construction of residential and small commercial buildings.

Interpretive Groups

Land capability classification (nonirrigated areas): 4e

Ecological site: Sandy Loam

Pasture management group: Loamy Upland

RvC2—Rosanky fine sandy loam, 3 to 5 percent slopes, eroded

Setting

Landform: Upland

Distinctive landscape features: Sheet erosion has removed more than half of the surface layer in most areas and, in a few places, has exposed the subsoil. Rills and shallow gullies can be crossed with regular farm equipment in some areas.

Landscape position: Upper and lower side slopes

Slope: Gently sloping; convex surfaces

Shape of areas: Irregular

Size of areas: 10 to 40 acres

Typical Profile

Surface layer:

0 to 4 inches—pale brown, moderately acid fine sandy loam

Subsoil:

4 to 35 inches—red, strongly acid clay

35 to 43 inches—reddish yellow, strongly acid sandy clay loam

43 to 54 inches—yellowish red, strongly acid fine sandy loam

Soil Survey of Robertson County, Texas

Underlying material:

54 to 61 inches—reddish yellow, strongly acid sandy clay loam that has strata of weakly cemented sandstone

61 to 80 inches—stratified brownish yellow, strongly acid weakly cemented sandstone and light gray shale

Soil Properties

Depth: Very deep

Drainage class: Well drained

Water table: None within a depth of 6 feet

Flooding: None

Runoff: Medium

Permeability: Moderately slow

Available water capacity: Moderate

Root zone: Very deep

Natural soil fertility: Low

Shrink-swell potential: Medium

Hazard of water erosion: Severe

Composition

Rosanky soil and similar inclusions: 85 to 95 percent

Contrasting inclusions: 5 to 15 percent

Inclusions

Similar inclusions:

- The slowly permeable Hearne soils on the higher ridgetops
- A soil that is similar to the Rosanky soil but that has small gullies typically 3 to 5 feet deep and, in some areas, 8 to 10 feet deep

Contrasting inclusions:

- The moderately permeable Gasil soils on the lower side slopes

Use and Management

Major land use: Rangeland

Other land uses: Pastureland

Pasture

Major limitations:

- Water erosion is a severe hazard during seedbed preparation for improved grasses.
- Areas of sheet and rill erosion and small gullies may require mechanical shaping before improved grasses can be established.

Minor limitations:

- The moderately slow permeability restricts water movement and the root development of improved grasses.
- The moderate available water capacity limits the yield potential of improved grasses during periods of drought.

Cropland

Major limitations:

- Because of the severe hazard of water erosion, this soil is poorly suited to growing crops.
- Soil fertility is low because erosion has removed much of the surface layer.

Rangeland

Major limitations:

- The low natural fertility and erosion of the surface layer limit the yield potential of native plants.

Minor limitations:

- The moderately slow permeability restricts water movement and the root development of native plants.
- The moderate available water capacity limits the yield potential of native forage plants during periods of drought.

Urban development

Major limitations:

- The moderately slow permeability can interfere with the proper functioning of septic tank absorption fields.
- The low soil strength is a limitation affecting the construction of local roads and streets.
- The risk of corrosion is high for uncoated steel.

Minor limitations:

- The shrink-swell potential is a limitation affecting the construction of residential and small commercial buildings.
- Because erosion has removed the surface layer, lawns and landscaping plants are difficult to establish.

Interpretive Groups

Land capability classification (nonirrigated areas): 4e

Ecological site: Sandy Loam

Pasture management group: Poorly Suited

Sa—Sandow loam, 0 to 2 percent slopes, frequently flooded

Setting

Landform: Flood plain

Landscape position: Broad, smooth areas adjacent to major drainageways

Slope: Nearly level; plane surfaces

Shape of areas: Elongated

Size of areas: 50 to 500 acres

Typical Profile

Surface layer:

0 to 9 inches—brown, moderately acid loam

Subsoil:

9 to 19 inches—brown, slightly acid clay loam that has pale brown mottles

19 to 26 inches—light yellowish brown, neutral sandy clay loam that has brownish yellow mottles

26 to 38 inches—yellowish brown, neutral loam that has pale brown mottles

38 to 49 inches—pale brown, slightly acid fine sandy loam

49 to 80 inches—light yellowish brown, neutral loam

Soil Properties

Depth: Very deep

Soil Survey of Robertson County, Texas

Drainage class: Moderately well drained

Water table: A seasonal water table is at a depth of 3.5 to 6.0 feet; mainly from December to April

Flooding: More than 50 times in 100 years; for a period of 2 to 7 days

Runoff: Medium

Permeability: Moderately slow

Available water capacity: Moderate

Root zone: Very deep

Natural soil fertility: High

Shrink-swell potential: Medium

Hazard of water erosion: Slight

Composition

Sandow soil and similar inclusions: 85 to 95 percent

Contrasting inclusions: 5 to 15 percent

Inclusions

Similar inclusions:

- Upland soils in similar positions on flood plains

Contrasting inclusions:

- The somewhat poorly drained Oletha soils in the slightly lower positions on flood plains
- The very slowly permeable Zilaboy soils in similar and slightly lower positions on flood plains

Use and Management

Major land use: Rangeland

Other land uses: Pasture

Pasture

Major limitations: None

Minor limitations:

- Soil wetness caused by flooding limits the use of mechanical equipment.
- Flooding can disrupt livestock grazing for brief periods.
- The moderate available water capacity limits the yield potential of improved grasses during periods of drought.

Cropland

Major limitations:

- Because of the hazard of flooding, this soil is unsuitable for cropland.

Rangeland

Major limitations: None

Minor limitations:

- The moderate available water capacity limits the yield potential of native plants during periods of drought.
- Flooding can disrupt livestock grazing for brief periods.

Urban development

Major limitations:

- Because of the hazard of flooding, this soil is unsuitable for dwellings and most other urban uses.
- The flooding is a limitation affecting the construction of local roads and streets.
- The risk of corrosion is high for uncoated steel.

Interpretive Groups

Land capability classification (nonirrigated areas): 5w

Ecological site: Loamy Bottomland

Pasture management group: Loamy Bottomland

ShA—Ships clay, 0 to 1 percent slopes, rarely flooded

Setting

Landform: Flood plain

Distinctive landscape features: Gilgai microrelief in undisturbed areas

Landscape position: Broad, smooth areas within the flood plain of the Brazos River

Slope: Nearly level; plane surfaces

Shape of areas: Irregular

Size of areas: 20 to 500 acres

Typical Profile

Surface layer:

0 to 6 inches—dark reddish gray, moderately alkaline clay

Subsoil:

6 to 35 inches—reddish brown, moderately alkaline clay

35 to 70 inches—moderately alkaline clay that is brown in the upper part and reddish brown in the lower part

70 to 80 inches—reddish brown, moderately alkaline clay

Soil Properties

Depth: Very deep

Drainage class: Moderately well drained

Water table: None within a depth of 6 feet

Flooding: 1 to 5 times in 100 years; for a period of 2 to 7 days

Runoff: High

Permeability: Very slow

Available water capacity: High

Root zone: Very deep

Natural soil fertility: High

Shrink-swell potential: Very high

Hazard of water erosion: Slight

Composition

Ships soil and similar inclusions: 85 to 95 percent

Contrasting inclusions: 5 to 15 percent

Inclusions

Similar inclusions:

- The somewhat poorly drained Roetex soils in depressions on flood plains

Contrasting inclusions:

- The well drained, moderately rapidly permeable Coarsewood soils in the slightly higher positions on flood plains
- The well drained, slowly permeable Highbank soils in similar positions on flood plains
- The well drained, moderately permeable Weswood soils in the slightly higher positions on flood plains



Figure 12.—Cotton and grain sorghum in an area of Ships clay, 0 to 1 percent slopes, rarely flooded.

Use and Management

Major land use: Cropland (fig. 12)

Other land uses: Pasture and rangeland

Pasture

Major limitations:

- The very slow permeability restricts water movement and the root development of improved grasses.
- The clay surface layer requires a well prepared seedbed for the establishment of improved grasses.

Cropland

Major limitations:

- The very slow permeability restricts water movement and the root development of crops.

Minor limitations:

- The clay surface layer is more difficult to till when the soil is too wet or too dry.
- Extended periods of wetness delay field operations.

Rangeland

Major limitations:

- The very slow permeability restricts water movement and the root development of native plants.

Urban development

Major limitations:

- Because of the hazard of flooding, this soil is unsuitable for dwellings and poorly suited for most other urban uses.

- The flooding, shrink-swell potential, and low soil strength are limitations affecting the construction of local roads and streets.
- The risk of corrosion is high for uncoated steel.

Interpretive Groups

Land capability classification: 2s

Ecological site: Clayey Bottomland

Pasture management group: Clayey Bottomland

ShB—Ships clay, 1 to 3 percent slopes, rarely flooded

Setting

Landform: Flood plain

Landscape position: Side slopes adjacent to natural drainageways within the flood plain of the Brazos River

Slope: Very gently sloping; convex surfaces

Shape of areas: Narrow and elongated

Size of areas: 10 to 150 acres

Typical Profile

Surface layer:

0 to 15 inches—moderately alkaline clay that is dark reddish gray in the upper part and reddish brown in the lower part

Subsoil:

15 to 24 inches—red, moderately alkaline clay

24 to 50 inches—reddish brown, moderately alkaline clay

50 to 65 inches—light brown, moderately alkaline clay that has thin strata of silt loam

65 to 80 inches—light brown, moderately alkaline clay that has thin strata of pink loam

Soil Properties

Depth: Very deep

Drainage class: Moderately well drained

Water table: None within a depth of 6 feet

Flooding: 1 to 5 times in 100 years; for a period of 2 to 7 days

Runoff: Very high

Permeability: Very slow

Available water capacity: High

Root zone: Very deep

Natural soil fertility: High

Shrink-swell potential: Very high

Hazard of water erosion: Moderate

Composition

Ships soil and similar inclusions: 85 to 95 percent

Contrasting inclusions: 5 to 15 percent

Inclusions

Similar inclusions:

- A soil that is similar to the Ships soil but that is frequently flooded

Contrasting inclusions:

- The well drained, rapidly permeable Coarsewood soils and the moderately permeable Weswood soils on similar side slopes adjacent to drainageways

Use and Management

Major land use: Rangeland

Other land uses: Cropland and pasture

Pasture

Major limitations:

- The very slow permeability restricts water movement and the root development of improved grasses.
- The clay surface layer requires a well prepared seedbed for the establishment of improved grasses.

Minor limitations:

- Water erosion is a moderate hazard during seedbed preparation for improved grasses.

Cropland

Major limitations:

- The very slow permeability restricts water movement and the root development of crops.

Minor limitations:

- Water erosion is a moderate hazard when the soil is cultivated.
- The clay surface layer is more difficult to till when the soil is too wet or too dry.

Rangeland

Major limitations:

- The very slow permeability restricts water movement and the root development of native plants.

Urban development

Major limitations:

- Because of the hazard of flooding, this soil is unsuitable for most dwellings and poorly suited to other urban uses.
- The flooding, low soil strength, and shrink-swell potential are limitations affecting the construction of local roads and streets.
- The risk of corrosion is high for uncoated steel.

Interpretive Groups

Land capability classification: 2e

Ecological site: Clayey Bottomland

Pasture management group: Clayey Bottomland

Sk—Ships clay, 0 to 1 percent slopes, frequently flooded

Setting

Landform: Flood plain

Distinctive landscape features: Gilgai microrelief in undisturbed areas

Landscape position: Small depressions and areas adjacent to small drainageways within the flood plain of the Brazos River

Slope: Nearly level; plane and weakly concave surfaces

Shape of areas: Elongated to oval

Size of areas: 10 to 200 acres

Typical Profile

Surface layer:

0 to 10 inches—brown, moderately alkaline clay

Subsoil:

10 to 65 inches—reddish brown, moderately alkaline clay

65 to 80 inches—brown, moderately alkaline clay

Soil Properties

Depth: Very deep

Drainage class: Moderately well drained

Water table: None within a depth of 6 feet

Flooding: More than 50 times in 100 years; for a period of 2 to 7 days

Runoff: High

Permeability: Very slow

Available water capacity: High

Root zone: Very deep

Natural soil fertility: High

Shrink-swell potential: Very high

Hazard of water erosion: Slight

Composition

Ships soil and similar inclusions: 90 to 95 percent

Contrasting inclusions: 5 to 10 percent

Inclusions

Similar inclusions:

- The somewhat poorly drained Roetex soils in the slightly lower positions on flood plains
- A soil that is similar to the Ships soil but that is rarely flooded

Contrasting inclusions:

- The well drained, slowly permeable Highbank soils and the well drained, moderately permeable Weswood soils in the slightly higher positions on flood plains

Use and Management

Major land use: Pasture

Other land uses: Rangeland

Pasture

Major limitations:

- The very slow permeability restricts water movement and the root development of improved grasses.
- The clay surface layer requires a well prepared seedbed to establish improved grasses.

Minor limitations:

- The use of mechanical equipment is limited due to the wetness caused by flooding.
- Flooding can disrupt livestock grazing for brief periods.

Cropland

Major limitations:

- Because of the hazard of flooding, this soil is unsuitable for cropland.

Rangeland

Major limitations:

- The very slow permeability restricts water movement and the root development of native plants.

Minor limitations:

- Flooding can disrupt livestock grazing for brief periods.

Urban development

Major limitations:

- Because of the hazard of flooding, this soil is unsuitable for dwellings and most other urban uses.
- The flooding, shrink-swell potential, and low soil strength are limitations affecting the construction of local roads and streets.
- The risk of corrosion is high for uncoated steel.

Interpretive Groups

Land capability classification (nonirrigated areas): 5w

Ecological site: Clayey Bottomland

Pasture management group: Clayey Bottomland

SmC—Silawa loamy fine sand, 2 to 5 percent slopes

Setting

Landform: Stream terrace

Landscape position: Ridgetops and upper side slopes

Slope: Very gently sloping or gently sloping; convex surfaces

Shape of areas: Elongated or irregular

Size of areas: 20 to 200 acres

Typical Profile

Surface layer:

0 to 6 inches—yellowish brown, moderately acid loamy fine sand

Subsurface layer:

6 to 15 inches—light yellowish brown, strongly acid loamy fine sand

Subsoil:

15 to 57 inches—red, very strongly acid sandy clay loam that has strong brown mottles

Underlying material:

57 to 80 inches—red, very strongly acid fine sandy loam

Soil Properties

Depth: Very deep

Drainage class: Well drained

Water table: None within a depth of 6 feet

Flooding: None

Runoff: Low

Permeability: Moderate

Available water capacity: Moderate

Root zone: Very deep

Natural soil fertility: Low

Shrink-swell potential: Low

Hazard of water erosion: Moderate

Composition

Silawa soil and similar inclusions: 85 to 95 percent

Contrasting inclusions: 5 to 15 percent

Inclusions

Similar inclusions:

- Bastrop soils in the slightly lower convex areas on terraces
- Dutek soils in similar areas on ridgetops
- Gasil soils in the slightly higher positions on uplands
- A soil that is similar to the Silawa soil but that has a surface layer of fine sandy loam

Contrasting inclusions:

- The somewhat excessively drained Desan soils in the slightly higher convex areas on terraces
- The somewhat excessively drained, rapidly permeable Eufaula soils in the slightly lower broad, smooth areas

Use and Management

Major land use: Pasture

Other land uses: Rangeland and cropland

Pasture

Major limitations:

- Seepage is a problem for livestock ponds, and pond construction is not recommended.

Minor limitations:

- Water erosion is a moderate hazard during seedbed preparation for improved grasses.
- The moderate available water capacity limits the growth of improved grasses during periods of drought.

Cropland

Major limitations: None

Minor limitations:

- Water erosion is a moderate hazard when this soil is cultivated.
- The moderate available water capacity limits the growth of crops during periods of drought.

Rangeland

Major limitations:

- The low natural fertility limits the yield potential of native plants.
- Seepage is a problem for livestock ponds, and pond construction is not recommended.

Minor limitations:

- The moderate available water capacity limits the growth of native plants during periods of drought.

Urban development

Major limitations: None

Minor limitations:

- The risk of corrosion is moderate for uncoated steel and concrete.

Interpretive Groups

Land capability classification (nonirrigated areas): 3e

Ecological site: Sandy Loam

Pasture management group: Sandy Upland

SmD—Silawa loamy fine sand, 5 to 8 percent slopes

Setting

Landform: Stream terrace

Landscape position: Side slopes

Slope: Moderately sloping; convex surfaces

Shape of areas: Elongated or irregular

Size of areas: 10 to 100 acres

Typical Profile

Surface layer:

0 to 13 inches—pale brown, strongly acid loamy fine sand

Subsoil:

13 to 24 inches—red, strongly acid sandy clay loam

24 to 30 inches—red, moderately acid sandy clay loam

30 to 36 inches—red, moderately acid fine sandy loam

36 to 48 inches—light red, moderately acid fine sandy loam

Underlying material:

48 to 80 inches—reddish yellow, slightly acid loamy fine sand

Soil Properties

Depth: Very deep

Drainage class: Well drained

Water table: None within a depth of 6 feet

Flooding: None

Runoff: Medium

Permeability: Moderate

Available water capacity: Moderate

Root zone: Very deep

Natural soil fertility: Low

Shrink-swell potential: Low

Hazard of water erosion: Severe

Composition

Silawa soil and similar inclusions: 85 to 95 percent

Contrasting inclusions: 5 to 15 percent

Inclusions

Similar inclusions:

- Dutek soils in similar positions on side slopes
- A soil that is similar to the Silawa soil but that has a surface layer of fine sandy loam

Contrasting inclusions:

- The somewhat excessively drained Desan soils on the lower side slopes

Use and Management

Major land use: Pasture

Other land uses: Rangeland

Pasture

Major limitations:

- Erosion is a severe hazard during seedbed preparation for improved grasses.
- Seepage is a problem for livestock ponds, and pond construction is not recommended.

Minor limitations:

- The moderate available water capacity limits the growth of improved grasses during periods of drought.

Cropland

Major limitations:

- Erosion is a severe hazard if this soil is cultivated.

Minor limitations:

- The moderate available water capacity limits the growth of crops during periods of drought.

Rangeland

Major limitations:

- The low natural fertility limits the yield potential of native plants.
- Seepage is a problem for livestock ponds, and pond construction is not recommended.

Minor limitations:

- The moderate available water capacity limits the growth of native plants during periods of drought.

Urban development

Major limitations: None

Minor limitations:

- The slope is a limitation affecting the construction of small commercial buildings.
- The risk of corrosion is moderate for uncoated steel and concrete.

Interpretive Groups

Land capability classification (nonirrigated areas): 4e

Ecological site: Sandy Loam

Pasture management group: Sandy Upland

SnB—Silstid loamy fine sand, 1 to 3 percent slopes

Setting

Landform: Upland

Landscape position: Broad smooth ridges

Slope: Very gently sloping; convex surfaces

Shape of areas: Irregular

Size of areas: 20 to 300 acres

Typical Profile

Surface layer:

0 to 6 inches—pale brown, slightly acid loamy fine sand

Soil Survey of Robertson County, Texas

Subsurface layer:

6 to 29 inches—very pale brown, slightly acid loamy fine sand

Subsoil:

29 to 41 inches—brownish yellow, slightly acid sandy clay loam that has yellowish red and light yellowish brown mottles

41 to 48 inches—brownish yellow, strongly acid sandy clay loam that has yellowish red mottles

48 to 63 inches—brownish yellow, strongly acid sandy clay loam that has yellowish red mottles

63 to 80 inches—mottled red and brownish yellow, strongly acid sandy clay loam

Soil Properties

Depth: Very deep

Drainage class: Well drained

Water table: None within a depth of 6 feet

Flooding: None

Runoff: Very low

Permeability: Moderate

Available water capacity: Moderate

Root zone: Very deep

Natural soil fertility: Low

Shrink-swell potential: Low

Hazard of water erosion: Slight

Composition

Siltstid soil and similar inclusions: 85 to 95 percent

Contrasting inclusions: 5 to 15 percent

Inclusions

Similar inclusions:

- Gasil and Padina soils in similar broad, smooth areas
- The moderately well drained, slowly permeable Robco soils in the lower positions on side slopes

Contrasting inclusions:

- The somewhat excessively drained, rapidly permeable Arenosa soils in the slightly higher broad, smooth areas
- The somewhat excessively drained, rapidly permeable Eufaula soils in the lower positions on terraces
- The slowly permeable Hearne soils in higher positions on ridgetops
- The moderately slowly permeable Rosanky soils on low ridges and hills

Use and Management

Major land use: Pasture

Other land uses: Rangeland and cropland

Pasture

Major limitations: None

Minor limitations:

- The moderate available water capacity limits the growth of improved grasses during periods of drought.
- Seepage is a limitation affecting the construction of livestock ponds.

Cropland

Major limitations: None

Minor limitations:

- The moderate available water capacity limits the growth of most crops during periods of drought.
- When dry, the surface is loose and provides poor traction for farm machinery.

Rangeland

Major limitations:

- The low natural fertility limits the yield potential of native plants.

Minor limitations:

- The moderate available water capacity limits the growth of native plants during periods of drought.
- Seepage is a limitation affecting the construction of livestock ponds.

Urban development

Major limitations:

- Because of the sandy soil texture, effluent can seep into ground water when this soil is used for septic tank absorption fields.
- Excavation sidewalls are unstable because of the sandy soil texture.

Minor limitations:

- Because of the moderate available water capacity, establishing and maintaining lawns and landscape plants is more difficult.
- The risk of corrosion is moderate for uncoated steel and concrete.

Interpretive Groups

Land capability classification (nonirrigated areas): 3s

Ecological site: Sandy

Pasture management group: Sandy Upland

SnD—Silstid loamy fine sand, 3 to 8 percent slopes

Setting

Landform: Upland

Landscape position: Side slopes

Slope: Gently sloping to moderately sloping; convex surfaces

Shape of areas: Irregular to elongated

Size of areas: 20 to 300 acres

Typical Profile

Surface layer:

0 to 5 inches—pale brown, moderately acid loamy fine sand

Subsurface layer:

5 to 27 inches—very pale brown, moderately acid loamy fine sand

Subsoil:

27 to 45 inches—reddish yellow, strongly acid sandy clay loam that has brownish yellow and red mottles

45 to 80 inches—brownish yellow, strongly acid sandy clay loam that has yellowish red, red, reddish brown, and light yellowish brown mottles

Soil Properties

Depth: Very deep
Drainage class: Well drained
Water table: None within a depth of 6 feet
Flooding: None
Runoff: Low
Permeability: Moderate
Available water capacity: Moderate
Root zone: Very deep
Natural soil fertility: Low
Shrink-swell potential: Low
Hazard of water erosion: Moderate

Composition

Siltstid soil and similar inclusions: 85 to 95 percent
Contrasting inclusions: 5 to 15 percent

Inclusions

Similar inclusions:

- Gasil and Padina soils in similar positions on side slopes
- The moderately well drained, slowly permeable Robco soils in the lower positions on side slopes

Contrasting inclusions:

- The excessively drained, rapidly permeable Arenosa soils in the higher positions on side slopes
- The slowly permeable Hearne soils in similar and higher positions on ridgetops
- The moderately slowly permeable Rosanky soils on side slopes of lower ridges

Use and Management

Major land use: Pasture

Other land uses: Rangeland and cropland

Pasture

Major limitations: None

Minor limitations:

- Water erosion is a moderate hazard during seedbed preparation for improved grasses.
- The moderate available water capacity limits the growth of improved grasses during periods of drought.
- Seepage is a limitation affecting the construction of livestock ponds.

Cropland

Major limitations: None

Minor limitations:

- Water erosion is a moderate hazard when this soil is cultivated.
- The moderate available water capacity limits the growth of most crops during periods of drought.
- When dry, the surface is loose and provides poor traction for farm machinery.

Rangeland

Major limitations:

- The low natural fertility limits the yield potential of native plants.

Minor limitations:

- The moderate available water capacity limits the growth of native plants during periods of drought.
- Seepage is a limitation affecting the construction of livestock ponds.

Urban development

Major limitations:

- Because of the sandy soil texture, effluent can seep into ground water when this soil is used for septic tank absorption fields.
- Excavation sidewalls are unstable because of the sandy soil texture.

Minor limitations:

- The slope is a limitation affecting the construction of small buildings.
- Because of the moderate available water capacity, establishing and maintaining lawns and landscape plants is more difficult.
- The risk of corrosion is moderate for uncoated steel and concrete.

Interpretive Groups

Land capability classification (nonirrigated areas): 3e

Ecological site: Sandy

Pasture management group: Sandy Upland

SpB—Spiller fine sandy loam, 1 to 3 percent slopes

Setting

Landform: Upland

Landscape position: Ridgetops and side slopes

Slope: Very gently sloping; convex surfaces

Shape of areas: Elongated to oval

Size of areas: 20 to 100 acres

Typical Profile

Surface layer:

0 to 8 inches—brown, slightly acid fine sandy loam

Subsurface layer:

8 to 12 inches—yellowish brown, neutral fine sandy loam

Subsoil:

12 to 21 inches—dark yellowish brown, slightly acid clay that has dark red and yellowish brown mottles

21 to 33 inches—brownish yellow, moderately acid clay that has red and dark yellowish brown mottles

33 to 53 inches—brownish yellow, moderately acid clay that has red and light brownish gray mottles

53 to 59 inches—brownish yellow, moderately acid clay loam that has red and light brownish gray mottles

Underlying material:

59 to 80 inches—mottled yellow and red, slightly acid sandy clay loam that has thin strata of light gray shale

Soil Properties

Depth: Very deep

Drainage class: Moderately well drained

Soil Survey of Robertson County, Texas

Water table: At a depth of more than 6 feet

Flooding: None

Runoff: High

Permeability: Slow

Available water capacity: Moderate

Root zone: Very deep

Natural soil fertility: Moderate

Shrink-swell potential: Medium

Hazard of water erosion: Moderate

Composition

Spiller soil and similar inclusions: 85 to 95 percent

Contrasting inclusions: 5 to 15 percent

Inclusions

Similar inclusions:

- The very slowly permeable Crockett soils in the lower positions in broad, convex areas
- The well drained, moderately slowly permeable Rosanky soils on low ridges and hills
- A soil that is similar to the Spiller soil; on slopes of more than 3 percent

Contrasting inclusions:

- The very slowly permeable Benchley soils on the lower side slopes on adjacent geologic members
- The very slowly permeable Rader and Tabor soils in the lower concave areas

Use and Management

Major land use: Pasture

Other land uses: Rangeland and cropland

Pasture

Major limitations: None

Minor limitations:

- Water erosion is a moderate hazard during seedbed preparation for improved grasses.
- The slow permeability restricts water movement and the root development of improved grasses.
- The moderate available water capacity limits the growth of improved grasses during periods of drought.

Cropland

Major limitations: None

Minor limitations:

- Water erosion is a moderate hazard when this soil is cultivated.
- The slow permeability restricts water movement and the root development of crops.
- The moderate available water capacity limits the growth of most crops during periods of drought.

Rangeland

Major limitations: None

Minor limitations:

- The slow permeability restricts water movement and the root development of native plants.
- The moderate natural fertility limits the yield potential of native plants.

- The moderate available water capacity limits the growth of native plants during periods of drought.

Urban development

Major limitations:

- The slow permeability can interfere with the proper functioning of septic tank absorption fields.
- The low soil strength is a limitation affecting the construction of local roads and streets.
- The risk of corrosion is high for uncoated steel.

Minor limitations:

- The shrink-swell potential is a limitation affecting the construction of residential and small commercial buildings.

Interpretive Groups

Land capability classification (nonirrigated areas): 3e

Ecological site: Sandy Loam

Pasture management group: Loamy Upland

TaA—Tabor fine sandy loam, 0 to 2 percent slopes

Setting

Landform: Stream terrace and relict terraces on uplands

Landscape position: Broad, smooth areas

Slope: Nearly level; plane to slightly concave surfaces

Shape of areas: Elongated to oblong

Size of areas: 20 to 200 acres

Typical Profile

Surface layer:

0 to 4 inches—brown, slightly acid fine sandy loam

Subsurface layer:

4 to 13 inches—light yellowish brown, slightly acid fine sandy loam

13 to 17 inches—pale brown, slightly acid fine sandy loam that has brown mottles

Subsoil:

17 to 28 inches—yellowish brown, strongly acid clay that has red and brownish yellow mottles

28 to 40 inches—light brownish gray, slightly acid clay that has yellowish brown and red mottles

40 to 58 inches—light brownish gray, neutral clay that has brownish yellow mottles

58 to 80 inches—light gray, slightly alkaline clay loam that has strong brown mottles

Soil Properties

Depth: Very deep

Drainage class: Moderately well drained

Water table: None within a depth of 6 feet

Flooding: None

Runoff: Very high

Permeability: Very slow

Available water capacity: Moderate

Root zone: Very deep

Natural soil fertility: Moderate



Figure 13.—Native range site of little bluestem in an area of Tabor fine sandy loam, 0 to 2 percent slopes.

Shrink-swell potential: High

Hazard of water erosion: Moderate

Composition

Tabor soil and similar inclusions: 85 to 95 percent

Contrasting inclusions: 5 to 15 percent

Inclusions

Similar inclusions:

- Bremond soils and the slowly permeable Chazos soils in the slightly higher positions in convex areas on terraces
- Crockett soils in broad, convex areas on adjacent uplands
- Rader soils in similar positions on terraces

Contrasting inclusions:

- The well drained, moderately permeable Silawa soils in the slightly higher positions in convex areas on terraces
- The Lufkin soils in concave areas on terraces

Use and Management

Major land use: Pasture

Other land uses: Rangeland and cropland (fig. 13)

Pasture

Major limitations:

- The very slow permeability in the subsoil restricts water movement and the root development of improved grasses.

Minor limitations:

- Water erosion is a moderate hazard during seedbed preparation for improved grasses.
- The moderate available water capacity limits the growth of improved grasses during periods of drought.

Cropland

Major limitations:

- The very slow permeability restricts water movement and the root development of crops.

Minor limitations:

- Water erosion is a moderate hazard when this soil is cultivated.
- The moderate available water capacity limits the growth of crops during periods of drought.

Rangeland

Major limitations:

- The very slow permeability restricts water movement and the root development of native plants.

Minor limitations:

- The moderate available water capacity limits the growth of native plants during periods of drought.
- The moderate natural fertility limits the yield potential of native plants.

Urban development

Major limitations:

- The high potential for shrinking and swelling can cause structural damage to residential and small commercial buildings.
- The very slow permeability can interfere with the proper functioning of septic tank absorption fields.
- The shrink-swell potential and low soil strength are limitations affecting the construction of local roads and streets.
- The risk of corrosion is high for uncoated steel and concrete.

Interpretive Groups

Land capability classification (nonirrigated areas): 3e

Ecological site: Sandy Loam

Pasture management group: Loamy Claypan

Uh—Uhland loam, 0 to 1 percent slopes, frequently flooded

Setting

Landform: Flood plain

Landscape position: Broad, smooth areas adjacent to drainageways

Slope: Nearly level; plane surfaces

Shape of areas: Elongated

Size of areas: 100 to 500 acres

Typical Profile

Surface layer:

0 to 3 inches—grayish brown, slightly acid loam

Soil Survey of Robertson County, Texas

Subsoil:

3 to 15 inches—pale brown, slightly acid very fine sandy loam that has strong brown and dark grayish brown mottles

15 to 22 inches—brown, slightly acid loam that has brown and dark gray mottles

22 to 43 inches—light yellowish brown, slightly acid very fine sandy loam that has grayish brown and dark yellowish brown mottles

43 to 48 inches—gray, slightly acid very fine sandy loam that has yellowish brown mottles

48 to 55 inches—light brownish gray, slightly acid very fine sandy loam that has dark yellowish brown mottles

55 to 80 inches—gray, moderately acid clay loam that has dark yellowish brown mottles

Soil Properties

Depth: Very deep

Drainage class: Moderately well drained

Water table: A seasonal water table is at a depth of 2.0 to 3.5 feet; mainly from March to May

Flooding: More than 50 times in 100 years; for a period of 2 to 7 days

Runoff: Negligible

Permeability: Moderately slow

Available water capacity: Moderate

Root zone: Very deep

Natural soil fertility: Moderate

Shrink-swell potential: Low

Hazard of water erosion: Slight

Composition

Umland soil and similar inclusions: 85 to 95 percent

Contrasting inclusions: 5 to 15 percent

Inclusions

Similar inclusions:

- Sandow soils and the moderately permeable Whitesboro soils in similar positions on flood plains

Contrasting inclusions:

- The very slowly permeable Zilaboy soils in the slightly lower positions on flood plains

Use and Management

Major land use: Rangeland

Other land uses: Pasture

Pasture

Major limitations: None

Minor limitations:

- The moderate available water capacity limits the growth of improved grasses during periods of drought.
- The use of mechanical equipment is limited due to the wetness caused by flooding.
- Flooding can disrupt livestock grazing for brief periods.

Cropland

Major limitations:

- Because of the hazard of flooding, this soil is unsuitable for cropland.

Rangeland

Major limitations: None

Minor limitations:

- The moderate available water capacity limits the growth of native plants during periods of drought.
- The moderate natural fertility limits the yield potential of native forage plants.
- Flooding can disrupt livestock grazing for brief periods.

Urban development

Major limitations:

- Because of the hazard of flooding, this soil is unsuitable for dwellings and most other urban uses.
- The flooding is a limitation affecting the construction of local roads and streets.
- The risk of corrosion is high for uncoated steel.

Interpretive Groups

Land capability classification (nonirrigated areas): 5w

Ecological site: Loamy Bottomland

Pasture management group: Loamy Bottomland

W—Water

This map unit consists of small, natural or constructed lakes, ponds, or pits that contain water most of the year.

This map unit is not assigned any interpretive groups.

WeA—Weswood silt loam, 0 to 1 percent slopes, rarely flooded

Setting

Landform: Flood plain

Landscape position: Broad, smooth areas within the flood plain of the Brazos River

Slope: Nearly level; plane surfaces

Shape of areas: Somewhat elongated to irregular

Size of areas: 20 to 500 acres

Typical Profile

Surface layer:

0 to 4 inches—brown, slightly alkaline silt loam

Subsoil:

4 to 12 inches—brown, slightly alkaline loam

12 to 26 inches—light brown, slightly alkaline very fine sandy loam

26 to 36 inches—brown, moderately alkaline silt loam

36 to 54 inches—moderately alkaline silty clay loam that is strong brown in the upper part and brown in the lower part

54 to 64 inches—brown, moderately alkaline silt loam

64 to 70 inches—brown, slightly alkaline silty clay

70 to 80 inches—very dark gray, moderately alkaline silty clay

Soil Properties

Depth: Very deep

Drainage class: Well drained

Water table: None within a depth of 6 feet

Flooding: 1 to 5 times in 100 years; for a period of 2 to 7 days

Runoff: Negligible

Permeability: Moderate

Available water capacity: High

Root zone: Very deep

Natural soil fertility: High

Shrink-swell potential: Low

Hazard of water erosion: Slight

Composition

Weswood soil and similar inclusions: 85 to 95 percent

Contrasting inclusions: 5 to 15 percent

Inclusions

Similar inclusions:

- The moderately rapidly permeable Coarsewood soils in similar positions on flood plains
- A soil that is similar to the Weswood soil but that has a surface layer of silty clay loam
- The moderately rapidly permeable Yahola soils on natural levees of drainageways within the flood plain

Contrasting inclusions:

- The slowly permeable Highbank soils in similar or slightly lower positions on flood plains
- The moderately well drained, very slowly permeable Ships soils in the slightly lower positions on flood plains

Use and Management

Major land use: Cropland

Other land uses: Pasture and rangeland

Pasture

Major limitations: None

Minor limitations:

- Seepage is a problem for livestock ponds, and pond construction is not recommended.

Cropland

Major limitations: None

Minor limitations:

- A compacted layer can form below the surface layer if tillage operations are performed while the soil is wet.

Rangeland

Major limitations: None

Minor limitations:

- Seepage is a problem for livestock ponds, and pond construction is not recommended.

Urban development

Major limitations:

- Because of the hazard of flooding, this soil is unsuitable for dwellings and most other urban uses.
- The low soil strength is a limitation affecting the construction of local roads and streets.
- The risk of corrosion is high for uncoated steel.

Interpretive Groups

Land capability classification: 1

Ecological site: Loamy Bottomland

Pasture management group: Loamy Bottomland

WwA—Weswood silty clay loam, 0 to 1 percent slopes, rarely flooded

Setting

Landform: Flood plain

Landscape position: Broad, smooth areas within the flood plain of the Brazos River

Slope: Nearly level; plane surfaces

Shape of areas: Somewhat elongated to irregular

Size of areas: 20 to 400 acres

Typical Profile

Surface layer:

0 to 7 inches—brown, moderately alkaline silty clay loam

Subsoil:

7 to 13 inches—brown, moderately alkaline silty clay loam

13 to 47 inches—light reddish brown, moderately alkaline silt loam

47 to 55 inches—light brown, moderately alkaline silt loam

Underlying material:

55 to 62 inches—light reddish brown, moderately alkaline silty clay loam that has bedding planes

62 to 80 inches—reddish brown, moderately alkaline silty clay

Soil Properties

Depth: Very deep

Drainage class: Well drained

Water table: None within a depth of 6 feet

Flooding: 1 to 5 times in 100 years; for a period of 2 to 7 days

Runoff: Negligible

Permeability: Moderate

Available water capacity: High

Root zone: Very deep

Natural soil fertility: High

Shrink-swell potential: Low

Hazard of water erosion: Slight

Composition

Weswood soil and similar inclusions: 85 to 95 percent

Contrasting inclusions: 5 to 15 percent

Inclusions

Similar inclusions:

- The moderately rapidly permeable Coarsewood soils in similar positions on flood plains
- A soil that is similar to the Weswood soil but that has a surface layer of silt loam

Contrasting inclusions:

- The slowly permeable Highbank soils in similar or slightly lower positions on flood plains
- The moderately well drained, very slowly permeable Ships soils in the slightly lower positions on flood plains
- The moderately rapid Yahola soils on natural levees of drainageways within the flood plain

Use and Management

Major land use: Cropland

Other land uses: Pasture and rangeland

Pasture

Major limitations: None

Minor limitations:

- Seepage is a problem for livestock ponds, and pond construction is not recommended.

Cropland

Major limitations: None

Minor limitations:

- A compacted layer can form below the surface layer if tillage operations are performed while the soil is wet.

Rangeland

Major limitations: None

Minor limitations:

- Seepage is a problem for livestock ponds, and pond construction is not recommended.

Urban development

Major limitations:

- Because of the hazard of flooding, this soil is unsuitable for dwellings and most other urban uses.
- The low soil strength is a limitation affecting the construction of local roads and streets.
- The risk of corrosion is high for uncoated steel.

Interpretive Groups

Land capability classification: 1

Ecological site: Loamy Bottomland

Pasture management group: Loamy Bottomland

WwB—Weswood silty clay loam, 1 to 3 percent slopes, rarely flooded

Setting

Landform: Flood plain

Landscape position: Natural levees adjacent to drainageways within the flood plain of the Brazos River

Slope: Very gently sloping; convex surfaces

Shape of areas: Elongated and narrow

Size of areas: 10 to 200 acres

Typical Profile

Surface layer:

0 to 9 inches—brown, moderately alkaline silty clay loam

Subsoil:

9 to 33 inches—brown, moderately alkaline silt loam

33 to 52 inches—strong brown, moderately alkaline silt loam that has thin bedding planes of reddish brown very fine sandy loam

52 to 68 inches—reddish yellow, moderately alkaline silt loam that has thin bedding planes of brown very fine sandy loam

Underlying material:

68 to 80 inches—pink, moderately alkaline very fine sandy loam that has thin bedding planes of brown silt loam

Soil Properties

Depth: Very deep

Drainage class: Well drained

Water table: None within a depth of 6 feet

Flooding: 1 to 5 times in 100 years; for a period of 2 to 7 days

Runoff: Low

Permeability: Moderate

Available water capacity: High

Root zone: Very deep

Natural soil fertility: High

Shrink-swell potential: Low

Hazard of water erosion: Moderate

Composition

Weswood soil and similar inclusions: 85 to 95 percent

Contrasting inclusions: 5 to 15 percent

Inclusions

Similar inclusions:

- The moderately rapidly permeable Coarsewood soils in similar positions on side slopes of natural drainageways
- A soil that is similar to the Weswood soil but that has a surface layer of silt loam
- A soil that is similar to the Weswood soil; on slopes of more than 3 percent

Contrasting inclusions:

- The moderately well drained, very slowly permeable Ships soils and the moderately rapidly permeable Yahola soils in similar positions on side slopes of natural drainageways

Use and Management

Major land use: Cropland

Other land uses: Pasture and rangeland

Pasture

Major limitations: None

Minor limitations:

- Water erosion is a moderate hazard during seedbed preparation for improved grasses.
- Seepage is a problem for livestock ponds, and pond construction is not recommended.

Cropland

Major limitations: None

Minor limitations:

- Water erosion is a moderate hazard when this soil is cultivated.
- A compacted layer can form below the surface layer if tillage operations are performed while the soil is wet.

Rangeland

Major limitations: None

Minor limitations:

- Seepage is a problem for livestock ponds, and pond construction is not recommended.

Urban development

Major limitations:

- Because of the hazard of flooding, this soil is unsuitable for dwellings and most other urban uses.
- The low soil strength is a limitation affecting the construction of local roads and streets.
- The risk of corrosion is high for uncoated steel.

Interpretive Groups

Land capability classification: 2e

Ecological site: Loamy Bottomland

Pasture management group: Loamy Bottomland

Wx—Weswood-Yahola complex, 0 to 3 percent slopes, frequently flooded

Setting

Landform: Flood plain

Distinctive landscape features: Undulating, elongated, narrow depressions and narrow ridges on flood plain point bars adjacent to the Brazos River. This unit is 55 percent Weswood soil (in the narrow depressions), 35 percent Yahola soil (on the narrow ridges), and 10 percent other soils.

Landscape position: Flood-plain point bars

Slope: Nearly level or very gently undulating; concave and convex surfaces

Shape of areas: Elongated

Size of areas: 20 to 120 acres

Typical Profile

Weswood

Surface layer:

0 to 7 inches—brown, moderately alkaline silty clay loam

Subsoil:

7 to 24 inches—brown, moderately alkaline silt loam

24 to 38 inches—reddish brown, moderately alkaline silty clay loam

38 to 63 inches—light reddish brown, moderately alkaline silt loam that has thin strata of dark brown silty clay

Underlying material:

63 to 80 inches—reddish yellow, moderately alkaline very fine sandy loam that has thin strata of brown silt loam

Yahola

Surface layer:

0 to 7 inches—brown, moderately alkaline fine sandy loam

Underlying material:

7 to 21 inches—brown, moderately alkaline fine sandy loam that has thin strata of very fine sandy loam

21 to 80 inches—pink, moderately alkaline fine sandy loam that has thin strata of silt loam

Soil Properties

Depth: Very deep

Drainage class: Well drained

Water table: None within a depth of 6 feet

Flooding: More than 50 times in 100 years; for a period of 2 to 7 days

Runoff: Weswood—low; Yahola—very low

Permeability: Weswood—moderately permeable; Yahola—moderately rapidly permeable

Available water capacity: Weswood—high; Yahola—moderate

Root zone: Very deep

Natural soil fertility: Weswood—high; Yahola—moderate

Shrink-swell potential: Low

Hazard of water erosion: Moderate

Composition

Note: These Weswood and Yahola soils occur as areas so intricately mixed that separating them in mapping was not practical.

Weswood soil and similar inclusions: 40 to 55 percent

Yahola soil and similar inclusions: 35 to 45 percent

Contrasting inclusions: 5 to 15 percent

Inclusions

Similar inclusions:

- The moderately rapidly permeable Coarsewood soils in similar and slightly higher positions on flood plains
- The moderately rapidly or rapidly permeable Gaddy soils on the lower point bars adjacent to the Brazos River

Contrasting inclusions:

- The moderately well drained, very slowly permeable Ships soils in the higher positions on flood plains

Use and Management

Major land use: Rangeland

Other land uses: Pasture

Pasture

Major limitations: None

Minor limitations:

- Water erosion is a moderate hazard during seedbed preparation for improved grasses.
- Soil wetness caused by flooding limits the use of mechanical equipment.
- Flooding can disrupt livestock grazing for brief periods.

Cropland

Major limitations:

- Because of the hazard of flooding, these soils are unsuitable for cropland.

Rangeland

Major limitations: None

Minor limitations:

- Flooding can disrupt livestock grazing for brief periods.

Urban development

Major limitations:

- Because of the hazard of flooding, these soils are unsuitable for dwellings and most other urban uses.
- The low soil strength and the flooding are limitations affecting the construction of local roads and streets.
- The risk of corrosion is high for uncoated steel.

Interpretive Groups

Land capability classification (nonirrigated areas): 5w

Ecological site: Loamy Bottomland

Pasture management group: Loamy Bottomland

**Wy—Whitesboro clay loam, 0 to 1 percent slopes,
frequently flooded**

Setting

Landform: Flood plain

Landscape position: Broad, smooth areas along major streams

Slope: Nearly level; plane surfaces

Shape of areas: Elongated

Size of areas: 30 to 300 acres

Typical Profile

Surface layer:

0 to 22 inches—slightly acid clay loam that is dark grayish brown in the upper part and brown in the lower part

Soil Survey of Robertson County, Texas

Subsoil:

22 to 29 inches—brown, neutral clay loam that has light brownish gray mottles

29 to 35 inches—dark gray, neutral loam that has dark yellowish brown mottles

35 to 80 inches—neutral loam that is brown in the upper part and yellowish brown in the lower part

Soil Properties

Depth: Very deep

Drainage class: Moderately well drained

Water table: None within a depth of 6 feet

Flooding: More than 50 times in 100 years; for a period of 2 to 7 days

Runoff: Negligible

Permeability: Moderate

Available water capacity: High

Root zone: Very deep

Natural soil fertility: High

Shrink-swell potential: Moderate

Hazard of water erosion: Slight

Composition

Whitesboro soil and similar inclusions: 85 to 95 percent

Contrasting inclusions: 5 to 15 percent

Inclusions

Similar inclusions:

- The moderately slowly permeable Sandow and Uhland soils in similar positions on flood plains
- A soil that is similar to the Whitesboro soil but that has a dark surface layer less than 20 inches thick

Contrasting inclusions:

- The very slowly permeable Zilaboy soils in the slightly lower positions on flood plains

Use and Management

Major land use: Rangeland

Other land uses: Pasture

Pasture

Major limitations: None

Minor limitations:

- Soil wetness caused by flooding limits the use of mechanical equipment.
- Flooding can disrupt livestock grazing for brief periods.

Cropland

Major limitations:

- Because of the hazard of flooding, this soil is unsuitable for cropland.

Rangeland

Major limitations: None

Minor limitations:

- Flooding can disrupt livestock grazing for brief periods.

Urban development

Major limitations:

- Because of the hazard of flooding, this soil is unsuitable for dwellings and most other urban uses.
- The low soil strength and flooding are limitations affecting the construction of local roads and streets.
- The risk of corrosion is high for uncoated steel.

Interpretive Groups

Land capability classification (nonirrigated areas): 5w

Ecological site: Loamy Bottomland

Pasture management group: Loamy Bottomland

WzA—Wilson loam, 0 to 1 percent slopes

Setting

Landform: Stream terrace and relict Pleistocene terrace on uplands

Landscape position: Broad, smooth areas

Slope: Nearly level; slightly concave and plane surfaces

Shape of areas: Oval or irregular

Size of areas: 10 to 200 acres

Typical Profile

Surface layer:

0 to 7 inches—dark grayish brown, neutral loam

Subsoil:

7 to 19 inches—very dark gray, neutral clay loam

19 to 31 inches—very dark gray, slightly alkaline clay

31 to 42 inches—dark gray, slightly alkaline clay that has brown mottles

42 to 52 inches—grayish brown, slightly alkaline clay that has light brownish gray mottles

52 to 67 inches—light gray, slightly alkaline clay

Underlying material:

67 to 75 inches—mottled light gray and light brown, moderately alkaline clay

75 to 80 inches—light brown, moderately alkaline clay that has gray mottles

Soil Properties

Depth: Very deep

Drainage class: Moderately well drained

Water table: None within a depth of 6 feet; surface layer and upper part of subsoil are seasonally wet and saturated during winter and spring for a period of 10 to 30 days

Flooding: None

Runoff: High

Permeability: Very slow

Available water capacity: Moderate

Root zone: Very deep

Natural soil fertility: Moderate

Shrink-swell potential: High

Hazard of water erosion: Slight

Composition

Wilson soil and similar inclusions: 85 to 95 percent

Contrasting inclusions: 5 to 15 percent

Inclusions

Similar inclusions:

- Burleson soils in similar broad, smooth areas
- Lufkin soils in the slightly lower concave areas

Contrasting inclusions:

- Bremond soils in the slightly higher convex areas on terraces

Use and Management

Major land use: Rangeland

Other land uses: Pasture and cropland

Pasture

Major limitations:

- The very slow permeability restricts water movement and the root development of improved grasses.

Minor limitations:

- The moderate available water capacity limits the yield potential of improved grasses during periods of drought.

Cropland

Major limitations:

- The very slow permeability restricts water movement and the root development of crops.

Minor limitations:

- Extended periods of wetness delay field operations.
- A crust forms on the surface when the soil is dry, thus inhibiting the growth of seedlings.
- The moderate available water capacity limits the yield potential of crops during periods of drought.

Rangeland

Major limitations:

- The very slow permeability restricts water movement and the root development of native plants.

Minor limitations:

- The moderate natural fertility limits the growth of native plants.
- The moderate available water capacity limits the yield potential of native plants during periods of drought.

Urban development

Major limitations:

- The high potential for shrinking and swelling can cause structural damage to residential and small commercial buildings.
- The very slow permeability and seasonal wetness can interfere with the proper functioning of septic tank absorption fields.
- The low soil strength and shrink-swell potential are limitations affecting the construction of local roads and streets.
- The risk of corrosion is high for uncoated steel and concrete.

Interpretive Groups

Land capability classification (nonirrigated areas): 3w

Ecological site: Claypan Prairie

Pasture management group: Seasonally Wet Loamy Claypan

YaA—Yahola fine sandy loam, 0 to 2 percent slopes, rarely flooded

Setting

Landform: Flood plain

Landscape position: Natural levees adjacent to drainageways within the flood plain of the Brazos River

Slope: Nearly level; plane or slightly convex surfaces

Shape of areas: Elongated or irregular

Size of areas: 20 to 200 acres

Typical Profile

Surface layer:

0 to 13 inches—brown, moderately alkaline fine sandy loam

Underlying material:

13 to 25 inches—pink, moderately alkaline very fine sandy loam

25 to 44 inches—light brown, moderately alkaline fine sandy loam

44 to 54 inches—reddish yellow, moderately alkaline fine sandy loam that has thin strata of light brown fine sandy loam

54 to 65 inches—light brown, moderately alkaline fine sandy loam

65 to 80 inches—strong brown, moderately alkaline very fine sandy loam

Soil Properties

Depth: Very deep

Drainage class: Well drained

Water table: None within a depth of 6 feet

Flooding: 1 to 5 times in 100 years; for a period of 2 to 7 days

Runoff: Very low

Permeability: Moderately rapid

Available water capacity: Moderate

Root zone: Very deep

Natural soil fertility: Moderate

Shrink-swell potential: Low

Hazard of water erosion: Slight

Composition

Yahola soil and similar inclusions: 85 to 95 percent

Contrasting inclusions: 5 to 15 percent

Inclusions

Similar inclusions:

- Coarsewood soils and the moderately permeable Weswood soils in the slightly lower positions in broad, smooth areas on flood plains

Contrasting inclusions:

- The slowly permeable Highbank soils and the moderately well drained, very slowly



Figure 14.—Grain sorghum in an area of Yahola fine sandy loam, 0 to 2 percent slopes, rarely flooded. This soil is used mainly as cropland.

permeable Ships soils in the slightly lower positions in broad, smooth areas on flood plains

Use and Management

Major land use: Cropland (fig. 14)

Other land uses: Pasture and rangeland

Pasture

Major limitations:

- Seepage is a problem for livestock ponds, and pond construction is not recommended.

Minor limitations:

- The moderate available water capacity limits the growth of improved grasses during periods of drought.

Cropland

Major limitations: None

Minor limitations:

- The moderate available water capacity limits the growth of crops during periods of drought.
- A compacted layer can form below the surface layer if tillage operations are performed while the soil is wet.

Rangeland

Major limitations:

- Seepage is a problem for livestock ponds, and pond construction is not recommended.

Minor limitations:

- The moderate available water capacity limits the growth of native plants during periods of drought.
- The moderate natural fertility limits the yield potential of native plants.

Urban development

Major limitations:

- Because of the hazard of flooding, this soil is unsuitable for dwellings and most other urban uses.
- Excavation sidewalls are unstable because of the sandy soil texture.

Minor limitations:

- Flooding is a limitation affecting the construction of local roads and streets.

Interpretive Groups

Land capability classification (nonirrigated areas): 2e

Ecological site: Loamy Bottomland

Pasture management group: Loamy Bottomland

Zb—Zilaboy clay, 0 to 1 percent slopes, frequently flooded

Setting

Landform: Flood plain

Distinctive landscape features: Gilgai microrelief in undisturbed areas

Landscape position: Broad, smooth areas adjacent to major drainageways

Slope: Nearly level; plane surfaces

Shape of areas: Elongated or irregular

Size of areas: 20 to 300 acres

Typical Profile

Surface layer:

0 to 7 inches—gray, slightly acid clay

Subsoil:

7 to 64 inches—grayish brown and dark grayish brown, moderately acid clay that has strong brown and brown mottles

64 to 80 inches—grayish brown, moderately acid clay that has brown and light brownish gray mottles

Soil Properties

Depth: Very deep

Drainage class: Moderately well drained

Water table: A seasonal high water table ranges from the surface to a depth of 3 feet; mainly from October to May

Flooding: More than 50 times in 100 years; for a period of 2 to 7 days

Runoff: High

Permeability: Very slow

Available water capacity: High

Root zone: Very deep

Natural soil fertility: High

Shrink-swell potential: High

Hazard of water erosion: Slight

Composition

Zilaboy soil and similar inclusions: 85 to 95 percent

Contrasting inclusions: 5 to 15 percent

Inclusions

Similar inclusions:

- The somewhat poorly drained Navasota soils in the slightly lower positions on flood plains

Contrasting inclusions:

- The somewhat poorly drained Oletha soils in the slightly lower positions on flood plains
- The moderately slowly permeable Sandow and Uhland soils in similar and slightly higher positions on flood plains

Use and Management

Major land use: Rangeland

Other land uses: Pasture

Pasture

Major limitations:

- The very slow permeability restricts water movement and the root development of improved grasses.

Minor limitations:

- Soil wetness caused by flooding limits the use of mechanical equipment.
- Flooding can disrupt livestock grazing for brief periods.

Cropland

Major limitations:

- Because of the hazard of flooding, this soil is unsuitable for cropland.

Rangeland

Major limitations:

- The very slow permeability restricts water movement and the root development of native plants.

Minor limitations:

- Flooding can disrupt livestock grazing for brief periods.

Urban development

Major limitations:

- Because of the hazard of flooding, this soil is unsuitable for dwellings and most other urban uses.
- The shrink-swell potential, the low soil strength, and the flooding are limitations affecting the construction of local roads and streets.
- The risk of corrosion is high for uncoated steel.

Interpretive Groups

Land capability classification (nonirrigated areas): 5w

Ecological site: Clayey Bottomland

Pasture management group: Clayey Bottomland

Use and Management of the Soils

This soil survey is an inventory and evaluation of the soils in the survey area. It can be used to adjust land uses to the limitations and potentials of natural resources and the environment. Also, it can help to prevent soil-related failures in land uses.

In preparing a soil survey, soil scientists, conservationists, engineers, and others collect extensive field data about the nature and behavioral characteristics of the soils. They collect data on erosion, droughtiness, flooding, and other factors that affect various soil uses and management. Field experience and collected data on soil properties and performance are used as a basis in predicting soil behavior.

Information in this section can be used to plan the use and management of soils for crops and pasture; as rangeland and woodland; as sites for buildings, sanitary facilities, highways and other transportation systems, and parks and other recreational facilities; and for wildlife habitat. It can be used to identify the potentials and limitations of each soil for specific land uses and to help prevent construction failures caused by unfavorable soil properties.

Planners and others using soil survey information can evaluate the effect of specific land uses on productivity and on the environment in all or part of the survey area. The survey can help planners to maintain or create a land use pattern in harmony with the natural soil.

Contractors can use this survey to locate sources of sand and gravel, roadfill, and topsoil. They can use it to identify areas where bedrock, wetness, or very firm soil layers can cause difficulty in excavation.

Health officials, highway officials, engineers, and others may also find this survey useful. The survey can help them plan the safe disposal of wastes and locate sites for pavements, sidewalks, campgrounds, playgrounds, lawns, and trees and shrubs.

Crops and Pasture

Rick Leopold, Conservation Agronomist, Natural Resources Conservation Service, Bryan, Texas, helped to prepare this section.

General management needed for crops and pasture is suggested in this section. The system of land capability classification used by the Natural Resources Conservation Service is explained, and the estimated yields of the main crops and hay and pasture plants are listed.

Planners of management systems for individual fields or farms should consider the detailed information given in the description of each soil under the heading "Detailed Soil Map Units." Specific information can be obtained from the local office of the Natural Resources Conservation Service or Texas Cooperative Extension.

Cropland

Cropland makes up about 15 percent of Robertson County. The major crops are cotton, corn, and grain sorghum. Additional crops include small grains, soybeans, watermelons, and other truck crops. Coarsewood, Highbank, Ships, and Weswood



Figure 15.—Hay from forage sorghum in an area of Ships clay, 0 to 1 percent slopes, rarely flooded.

soils on the Brazos River flood plain are commonly used for cropland. Most of the cotton, corn, and grain sorghum are grown on these soils (fig. 15).

Most small grains and a few small areas of corn and grain sorghum are grown on Benchley, Bremond, Chazos, Crockett, Edge, Gasil, Rader, and Silawa soils on uplands and terraces. Other soils are suitable for cropland but are currently in other uses.

Soil erosion is the major concern on almost all the cropland where slopes are more than 2 percent. Productivity is reduced as the surface layer is eroded and the subsoil is incorporated into the plow layer. This is especially true for soils that have a clay subsoil. Soil erosion on cropland also causes streams to fill with sediment. Where erosion is controlled, sediment pollution is minimized and the quality of water for municipal use, recreation, fisheries, and wildlife is improved.

Managing residue helps to control erosion and improve soil tilth. A cover of 30 percent or more of crop residue on the surface protects the soil against compacting rains, reduces crusting, minimizes runoff, and reduces the evaporation rates of soil moisture. Residue also shades the soil, thus reducing the soil temperature. In addition, the increased organic matter at the surface can help lessen the compacting effects of farm machinery. Crop residue needs to be protected from burning and overgrazing. Using the proper tillage equipment keeps residue on the surface. Residue management and minimum tillage can be used on nearly all of the cropland soils in Robertson County.

Contour terraces reduce slope lengths, thereby helping to minimize erosion on cropland. They are most practical on moderately deep and deep, loamy and clayey soils that have slopes of more than 1 percent.

Land leveling and surface drains are used on nearly level soils that have a loamy or clayey surface layer. They allow the movement of excess water out of the field, thus reducing crop damage. Land leveling is essential to water conservation and management because it allows irrigation water to spread evenly over a field.

All crops respond well to commercial fertilizer. Where fertilizers are applied

according to current soil tests and where erosion is controlled, fertility levels can be maintained. Proper pH must also be maintained to ensure that plants can utilize applied fertilizers. On very deep sandy soils, such as Padina soils, fertilizer, especially nitrogen, should be applied in split applications to ensure the best plant use and to protect water quality. Split applications should also be used on sloping fields where the runoff potential is high.

Weed and insect pests need to be controlled and properly identified on cropland. Type and extent of infestation vary according to the growing season and from year to year. Control measures should be applied when the pest population reaches a level where the control cost is less than the cost of the damage inflicted. All treatment options, which include mechanical, biological, or chemical treatments, should be analyzed, and the most highly recommended control measures selected. When chemical controls are used, label instructions should be followed in addition to local, State, and Federal laws regulating the use of chemicals.

Applications of agricultural chemicals that have a high potential for leaching should have limited use on sandy soils except in situations where no suitable substitute is available. Likewise, the use of chemicals that have a high runoff potential should be limited on clay soils.

Information on cropland management practices can be obtained at the local office of the Natural Resources Conservation Service or the Texas Cooperative Extension.

Pasture and Hayland

Land used for pasture and hayland in Robertson County is mainly planted to introduced grasses that respond to recommended management practices. Some of the species used are common and improved varieties of bermudagrass, bahiagrass, and kleingrass. Established bermudagrass and many other grass species can be overseeded with winter annuals, such as adapted clovers, ryegrass, or small grains for additional winter and early spring forage. Some cropland fields are used continuously for annual winter pasture production.

Well managed perennial warm-season pasture grasses usually produce more forage than is needed during the peak of the growing season. Excess pasture production is often harvested as hay for use during the winter. Some perennial grass as well as annual plantings of forage sorghum are managed strictly for hay production.

Year-round forage programs can be developed by planning land use and the kinds of forage to be grown. A planned grazing system maximizes production by providing a guide to stocking rates and allowing timely rest periods from grazing, thus resulting in a more efficient forage harvest.

Recommended pasture management practices include adequate fence arrangement for rotational grazing and efficient use of forage. Proper use of forage ensures that plant vigor remains high for continued production and control of soil erosion. Selection of the best adapted plants that meet the yield and economic goals of the operation is important. In a well managed pasture, weeds and brush are controlled, fertilizer is applied at the proper time and in the recommended amount, and an adequate supply of water is available for livestock.

Fertilizer should be applied in split applications throughout the growing season, such as after grazing cycles in pasture or after harvest on hayland. This practice is particularly important on sandy soils due to the potential for nitrogen and other nutrients to leach into ground water. Split applications should also be used on sloping clay soils due to their high runoff potential. Some soils need applications of agricultural limestone to correct acidity problems and allow better utilization of applied nutrients by plants. Soil pH should be maintained at a minimum of 5.5 for most grasses and, if legumes are to be overseeded, a pH of more than 5.5 must be maintained.

Hay production requires the same high management standards as pasture

production. In addition, the forage needs to be cut at the proper interval and height based on species requirements in order to maintain stand vigor and promote timely regrowth.

Pasture Management Groups

A pasture management group is a group of soils that have about the same level of productivity and have similar management concerns. The soils of Robertson County were rated and grouped based on characteristics that affect plant establishment and growth. The major characteristics that were considered include texture and thickness of the topsoil, drainage, erosion, available water-holding capacity, permeability, and soil depth.

The yields shown in the pasture management groups are estimates developed for established grasses. They are based on average climatic conditions, and it is assumed that recommended management practices are followed. Recommended management practices include setting economically feasible yield goals; establishing and maintaining the proper fertility levels (so that goals based on current soil test results can be attained); intensively rotating grazing; controlling weeds, insects, and disease; and brush management.

The yields for pasture are expressed in animal unit months (AUMs) for the grass most commonly grown in each group. An animal unit month is the length of time that the forage produced on 1 acre can feed one animal unit at a given utilization rate. An animal unit is the equivalent of one 1,000-pound animal. For example, a yield of 8 animal unit months provides forage for one animal unit for 8 months during the growing season. For another example, it takes 1.5 acres producing at this rate to provide adequate forage for one animal unit for 1 year, assuming that the excess forage produced during the growing season is harvested as hay for winter feeding. Estimated forage yields are given in table 5 for all soils suitable for pasture. They are based on a utilization rate of 60 percent. Utilization rate is the amount of the total forage produced that is actually consumed by livestock. The remaining portion of the forage is not utilized for grazing because of trampling and fouling by manure or because it is being used to control erosion. Bermudagrass and bahiagrass pasture should not be grazed or cut shorter than a height of 3 to 4 inches to ensure continued productivity and maintain or improve soil and water quality. Hay yields in tons per acre can be estimated by multiplying the AUM by 0.53.

The following description of each pasture management group discusses the soil characteristics that affect forage production, major grass and legume adaptation, yield estimate of major grasses, and management problems associated with forage production. Additional information about the soils is available in the sections "Detailed Soil Map Units" and "Soil Series and Their Morphology."

Loamy Upland Group. This group includes Bastrop, Benchley, Hammond, Margie, Rosanky, and Spiller soils in map units BaB, BeB, BeC, HaB, MgB, RsC, RsD, and SpB. These soils have a moderately acid to neutral loamy surface layer over a loamy to clayey subsoil. They occur on gently sloping to strongly sloping uplands and terraces. The soils generally have no major limitations affecting the production of forage; however, if adequate cover is not maintained on the sloping units, erosion can be a major limitation. In map unit HaB, fertility is a major limitation but it can be overcome by a complete fertilization program. Potential production of this pasture management group is 6 to 9 animal unit months of grazing in a normal year if recommended management is used.

Perennial grasses adapted to loamy upland soils include hybrid bermudagrass, common bermudagrass, bahiagrass, kleingrass, and switchgrass. Annual grasses grown on these soils include hay-grazer or forage sorghum in the summer and ryegrass, cereal rye, oat, and wheat in the cool season. Adapted annual legumes

include crimson clover and ball clover on Margie, Rosanky, and Spiller soils and arrowleaf clover, bur medic, rose clover, and hairy vetch on the remaining soils. Intensive management is required for a successful legume program.

Sandy Upland Group. This group includes Chazos, Dutek, Gasil, Robco, Silawa, and Silstid soils in map units ChC, DuB, DuD, GsB, GsD, RoB, SmC, SmD, SnB, and SnD. These soils are gently sloping to strongly sloping and are generally moderately acid to neutral in the surface and subsurface layers. The soils have a sandy surface layer over a loamy to clayey subsoil. They occur on uplands and terraces. A low or moderate available water capacity is a limitation affecting the production of pasture, but the rapid or moderately rapid permeability of the surface layer helps to offset this limitation. If adequate cover is not maintained on the steeper slopes, erosion can be a major limitation.

Droughtiness can be a problem with these soils, reducing production in some years. The soils, however, recover well if they are not overgrazed and good fertility levels are maintained. Due to the coarse surface texture and permeable subsoil, nutrient leaching, particularly the leaching of nitrogen, can be a problem. Agricultural chemicals with a high potential for leaching should not be used on these soils, unless no suitable substitute is available. The soils in this pasture management group can be expected to produce about 4 to 7 animal unit months of grazing in a normal year if recommended management is used.

Perennial grasses adapted to the soils in this group include hybrid bermudagrass, bahiagrass, common bermudagrass, and kleingrass. Annual grasses include forage sorghum and crabgrass in the summer and ryegrass and cereal rye in the cool season. Adapted annual cool-season legumes include ball clover, crimson clover, and hairy vetch. Summer legumes include cowpea, soybean, and alcyeclover.

Deep Sandy Group. This group consists of Desan and Padina soils in map units DfC, PaC, and PaE. Desan and Padina soils are moderately acid to neutral in the surface and subsurface layers. These soils have a thick sandy surface layer over a loamy subsoil, and they occur on gently sloping to moderately steep uplands and terraces. The major limitation is a poor ability to hold water for plant growth in the surface layers. However, the loamy subsoil has the ability to hold water for plant growth. This fact combined with the good infiltration rate of the surface layer results in a favorable situation for the growth of established deep-rooted forage plants.

Droughtiness can be a problem during establishment and may be a problem for established stands during dry periods in some years, which reduces production. These soils recover from drought well if they are not overgrazed and if adequate fertility is maintained. Erosion can be a major limitation on steep slopes if cover is not maintained.

Due to the coarse texture of the surface soil and the moderately permeable subsoil, nutrient leaching, particularly the leaching of nitrogen, can be a problem. Timing split applications of nutrients with planting is recommended. Agricultural chemicals that have a high potential for leaching should not be used on these soils unless no suitable substitute is available. The gently sloping Padina soils can be expected to produce about 7 animal unit months of grazing with normal rainfall and management. The steeper Padina soils and Desan soils, which have a slightly thicker surface layer and a reduced ability to hold water, have a production potential of about 5 animal unit months of grazing in a normal year if recommended management is used.

Adapted perennial grasses for the soils in this pasture management group include hybrid bermudagrass, weeping lovegrass, and Wilman lovegrass. Annual grasses include crabgrass in the summer and ryegrass in the cool season. Adapted annual legumes include hairy vetch for the cool season and partridge pea and alcyeclover for the summer. The success of warm- or cool-season annuals is dependant on rainfall.

Loamy Claypan Group. This group consists of Bremond, Crockett, Edge, Rader, and Tabor soils in map units BrB, CrB, EdC, RaA, and TaA. These soils are generally

characterized by a thin to moderately thick loamy surface layer over a dense clayey subsoil that has very slow permeability. They occur on gently sloping uplands and terraces. The pH in the surface and subsurface layers ranges from strongly acid to neutral. Seasonal wetness can be a minor limitation but is minimized due to adequate natural surface drainage. Another limitation affecting some areas is a moderate ability to hold water for plant growth.

In some years droughtiness may reduce production, but the soils recover well if they are not overgrazed and good fertility levels are maintained. Soil pH is more difficult to maintain on Rader and Tabor soils due to a somewhat acid subsoil. Erosion can be a limitation on the more sloping units if an adequate cover is not maintained. Loamy claypan soils are expected to yield about 5 to 7 animal unit months of grazing in a normal year if recommended management is used.

Perennial grasses adapted to this pasture management group include hybrid bermudagrass, bahiagrass, common bermudagrass, kleingrass, old world bluestems, and switchgrass. Adapted annual legumes include crimson clover, arrowleaf clover, subterranean clover, rose clover, and hairy vetch.

Clayey Group. This group includes Burleson, Dimebox, Lexton, and Luling soils in map units BuA, DmB, LeC, LeE, LuB, and LuC. These soils are moderately acid to slightly alkaline in the surface layer. Most are clayey throughout and occur on nearly level to strongly sloping uplands and terraces. Generally, the soils have a very slow permeability and a clay surface layer. The potential production of this group is about 5 to 8 animal unit months of grazing if recommended management is used.

Clayey soils are difficult to prepare for seeding or sprigging, especially if moisture conditions are not ideal. During dry periods these soils may become droughty, resulting in reduced production. Clay soils are slower to recover from drought than other soils. Care should be taken to avoid overgrazing during droughty periods. If adequate cover is not maintained on the steeper slopes, erosion could be a problem. Agricultural chemicals with high runoff potential should not be used on sloping clay soils unless no suitable substitute is available.

Adapted perennial grasses for this pasture management group include hybrid bermudagrass, kleingrass, common bermudagrass, old world bluestems, johnsongrass, and switchgrass. Annual grasses suited to these soils are forage sorghum and hay-grazer in the summer and ryegrass and wheat in the cool season. Adapted annual cool-season legumes include red clover, rose clover, singletary pea, sweetclover, bur medic, and hairy vetch.

Gravelly Loamy Claypan Group. This group includes the Hearne soil in map unit HrD. This soil is strongly acid. It has a surface layer of gravelly fine sandy loam over a clayey subsoil and occurs on moderately sloping uplands. The major limitations are the gravelly surface layer and slow permeability. A moderate ability to hold moisture for plant growth is a minor limitation.

Early in the growing season, excess water in the surface layer may cause delays in seedbed preparation and establishment of new stands. Gravel presents a minor problem for seedbed preparation. Droughtiness may affect establishment later in the season and reduces the production of established stands in most years. This soil recovers moderately well from drought if it is not overgrazed and fertility is maintained. The potential production of this group is about 4 to 5 animal unit months of grazing if recommended management is used.

Adapted perennial grasses for this soil management group include hybrid bermudagrass, kleingrass, bahiagrass, common bermudagrass, old world bluestems, and switchgrass. Annual grasses include forage sorghum, hay-grazer, and crabgrass in the summer and wheat, cereal rye, triticale, oat, and ryegrass in the cool season. Adapted cool-season annual legumes include crimson clover, ball clover, rose clover, singletary pea, Austrian winter pea, and hairy vetch.

Seasonally Wet Loamy Claypan Group. This group consists of the Bremond-

Wilson complex and Lufkin and Wilson soils in map units BsA, LfA, and WzA. The surface layer is strongly acid to slightly acid. The soils have a loamy surface layer over a clayey subsoil and occur on nearly level to very gently sloping terraces. The limitations are a very slow permeability and a relatively flat landscape position, resulting in excess wetness, typically in the spring and fall. Other limitations include a moderate ability to hold moisture for plant growth.

During wet periods, usually in the fall and spring, planting and establishing forage species are delayed and pasture failure may occur. The growth of established stands is thus inhibited. These soils become droughty after short dry periods. They can recover moderately well from drought if they are not overgrazed and if adequate fertility is maintained. Potential annual production for soils with seasonally wet claypans is about 5 to 6 animal unit months.

Adapted perennial grasses include hybrid bermudagrass, bahiagrass, common bermudagrass, kleingrass, and switchgrass. Annual grasses include crabgrass in the summer and oat and ryegrass in the cool season. Adapted annual cool-season legumes include ball clover, singletary pea, and hairy vetch.

Clayey Bottomland Group. This group consists of Oletha, Ships, and Zilaboy soils in map units Ot, ShA, ShB, Sk, and Zb. These soils are clayey throughout, except for the Oletha soils, which have a clay loam subsoil. Oletha soils are strongly acid, Zilaboy soils are slightly acid, and Ships soils are moderately alkaline. All of the soils occur on nearly level to gently sloping flood plains. Map units Ot, Sk, and Zb are frequently flooded for brief periods, and map units ShA and ShB are rarely flooded for brief periods. Very slow permeability is a major limitation for soils in map units ShA, ShB, Sk, and Zb. For map units Ot, Sk, and Zb, flooding is a minor limitation. Clayey bottomland soils have a production potential of about 4 to 7 animal unit months of grazing if recommended management is used.

These soils are difficult to prepare for seeding or sprigging, since they are often too wet for preparing a good seedbed. Wetness and flooding may cause the slow establishment or failure of new stands. Long wet periods reduce productivity in some years. Delays in hay harvest and interference with grazing are common during and after periods of flooding. Storing hay in areas of these soils is not recommended due to the risk of loss or damage in the event of a flood.

Adapted perennial grasses in this pasture management group include hybrid bermudagrass, common bermudagrass, bahiagrass, dallisgrass, johnsongrass, eastern gamagrass, Virginia wildrye, and switchgrass. Annual grasses include ryegrass, triticale, and wheat. The best adapted cool-season legumes are white clover, bur medic, and singletary pea.

Sandy Bottomland Group. This group consists of the Gaddy soil in map unit Ga. This soil is slightly alkaline to moderately alkaline and sandy throughout. It occurs on nearly level or gently sloping flood plains and is frequently flooded for brief periods. The low available water-holding capacity is the major limitation. Sandy bottomland soils have a production potential of about 4 to 5 animal unit months of grazing if recommended management is used.

This soil is difficult to prepare for seeding or sprigging since it can become too wet for preparing a good seedbed. Wetness and flooding may cause the slow establishment or failure of new seedings. Long wet periods reduce productivity in some years. Delays in hay harvest and interference with grazing are common during and after periods of flooding. Storing hay in areas of this soil is not recommended due to the risk of loss or damage in the event of a flood.

During dry periods, the establishment of new stands is slowed and stands occasionally fail. Production from established stands is affected by droughty periods throughout the year. Due to the coarse surface texture and the permeable subsoil, nutrient leaching, particularly of nitrogen, can be a problem. Application of nutrients should be split to meet the plants annual needs. Agricultural chemicals with a high

potential for leaching should not be used on this soil unless no suitable substitute is available. The potential annual production for this group is about 4 animal unit months.

Perennial grasses adapted to this pasture management group include hybrid bermudagrass, weeping lovegrass, and Wilman lovegrass. Adapted cool-season annual legumes include hairy vetch. Crabgrass may be used as a warm-season annual. All plantings are dependant on timely rainfall to succeed, and failure is common.

Loamy Bottomland Group. This group consists of Coarsewood, Highbank, Sandow, Uhland, Weswood, Weswood, Whitesboro, and Yahola soils in map units CoA, CoB, HsA, Sa, Uh, WeA, WwA, WwB, Wx, Wy, and YaA. These soils have a loamy surface layer and range from loamy to clayey as depth increases. They occur on nearly level or gently sloping flood plains. Soils in the Sa, Uh, Wx, and Wy map units are frequently flooded for brief or very brief periods. The remaining soils are rarely flooded for brief periods. Loamy bottomland soils have a production potential of about 6 to 9 animal unit months of grazing if recommended management is used.

These soils are difficult to prepare for seeding or sprigging, since they are often too wet for preparing a good seedbed. Wetness and flooding may cause the slow establishment or failure of new seedlings. Long wet periods reduce productivity in some years. Delays in hay harvest and interference with grazing are common during and after periods of flooding. Storing hay in areas of these soils is not recommended due to the risk of loss or damage in the event of a flood.

Adapted perennial grasses of this pasture management group include hybrid bermudagrass, common bermudagrass, bahiagrass, dallisgrass, johnsongrass, eastern gamagrass, Virginia wildrye, and switchgrass. Annual cool-season grasses include ryegrass, triticale, and wheat. The best adapted cool-season legumes are white clover, bur medic, and singletary pea.

Very Deep Sandy Group. This group consists of Arenosa and Eufaula soils in map units AaD and EuC. These soils are very strongly acid to slightly acid and are sandy throughout. They occur on gently sloping to strongly sloping uplands and terraces. The major limitations are a poor ability to hold water for plant growth, somewhat excessive drainage, and rapid permeability. The soils also have low or very low natural fertility.

Droughtiness slows the establishment of new stands and occasionally causes failure. Production from established stands is affected by droughty periods throughout the year. These soils recover from drought rapidly if they are not overgrazed and if adequate fertility is maintained. Due to the coarse surface texture and the permeable subsoil, nutrient leaching, particularly of nitrogen, can be a problem. Application of nutrients should be split to meet the plants annual needs. Agricultural chemicals with a high potential for leaching should not be used on these soils unless no suitable substitute is available. Potential annual production for this group is about 3 to 4 animal unit months.

Perennial grasses adapted to this pasture management group include hybrid bermudagrass, weeping lovegrass, and Wilman lovegrass. Adapted cool-season annual legumes include hairy vetch. Crabgrass may be used as a warm-season annual. All plantings are dependant on timely rainfall to succeed, and failure is common.

Poorly Suited Group. This group includes Crockett, Edge, Hammond, Hearne, and Rosanky soils in map units CrC2, EdC2, HaE, HeD, HnD, and RvC2. These soils have a thin loamy surface layer over a clayey or loamy subsoil, and some are shallow to bedrock. They occur on gently sloping to moderately steep uplands. Generally, the major limitations are a slow or very slow permeability, a poor ability to hold water for plant growth, and the slope. The soils in map units CrC2, EdC2, and RvC2 have sustained severe erosion in the past, and much of their original topsoil is gone. Shallow or moderate soil depth is a limitation for some units. These soils are marginal

for the production of pasture and hay. It may not be economically feasible to establish and maintain pasture grasses on these soils.

Droughtiness causes the slow establishment and possible failure of new stands. Production of established stands is reduced during dry periods in most years. In the map units that have the lowest pH, adequate amounts of lime should be applied and incorporated during establishment and additional applications should be made as needed to maintain the minimum pH for the selected grass. Because of the slope of some of these soils, management is difficult. Erosion is a concern during establishment and if adequate cover is not maintained on the steeper slopes. The potential production for this group when planted to pasture species is not much higher than if the existing native vegetation is managed properly.

In the event that planting is needed on the soils in this pasture management group, adapted grass species include hybrid bermudagrass, bahiagrass, common bermudagrass, kleingrass, and switchgrass. Legumes do not perform well if the pH is below 5.5; therefore, it is probably not cost effective to overseed these soils unless a liming program has been followed. Hairy vetch can grow reasonably well on any of these soils that have a surface pH of 5.0 or higher.

Not Suited Group. This group includes Cadelake, Edge, Hearne, Navasota, and Roetex soils in map units CaA, EgD2, EgD, HeE, HnE, Na, Nd, and Rr. These soils are not suitable for the production of pasture and hay. Because of the limitations, it is economically unfeasible to try to establish and maintain pasture grasses. The major limitations are the very low available water-holding capacity, soil acidity, removal of topsoil by erosion, and slope. Long periods of flooding and somewhat poor or poor drainage are the major limitations affecting the Navasota soil. A high water table and poor drainage are the major limitations affecting the Cadelake soil.

The soils of this pasture management group are best left undisturbed and managed under native vegetation. In the event that planting is needed for erosion control, adapted grass species include hybrid bermudagrass, bahiagrass, and common bermudagrass.

Yields per Acre

The yields per acre that can be expected of principal crops under proper management are shown in table 5, parts I and II. In the yields given for irrigated crops, it is assumed that the irrigation system is adapted to the soils and to the crops to be grown, that good-quality irrigation water is uniformly applied as needed, and that tillage is kept to a minimum. In any given year, yields may be higher or lower than those indicated in the table because of variations in management, rainfall, and other climatic factors.

The yields for cropland are based on the experience and records of farmers, conservationists, and extension agents. Available data from nearby counties is also considered. The estimated yields reflect the productive capacity of the soils for each of the principal crops. Yields are likely to increase as new production techniques are developed.

The management needed to obtain the indicated yields of the various crops depends on the kind of soil and the crop. Management is needed to control water erosion, maintain soil tilth, manage fertility, control weed and insect pests, and to maintain existing drainage systems. The major practices used to accomplish these tasks are conservation cropping sequence (rotation), residue management, conservation tillage, cover crops, terracing, contour farming, and nutrient and pest management. Land leveling and surface drainage, primarily on the Brazos River flood plain, are important water management practices in the county.

Crops other than those shown in table 5 are grown in the survey area, but estimated yields are not listed because the acreage of such crops is small. The local

office of the Natural Resources Conservation Service or of the Texas Cooperative Extension can provide information about the management and productivity of the soils for those crops.

Land Capability Classification

Land capability classification shows, in a general way, the suitability of soils for most kinds of field crops. Crops that require special management are excluded. The soils are grouped according to their limitations for field crops, the risk of damage if they are used for crops, and the way they respond to management. The criteria used in grouping the soils do not include major and generally expensive landforming that would change slope, depth, or other characteristics of the soils, nor do they include possible but unlikely major reclamation projects. Capability classification is not a substitute for interpretations designed to show suitability and limitations of groups of soils for rangeland, for woodland, and for engineering purposes.

In the capability system, soils generally are grouped at three levels—capability class, subclass, and unit (16). Only class and subclass are used in this survey.

Capability classes, the broadest groups, are designated by numerals 1 through 8. The numerals indicate progressively greater limitations and narrower choices for practical use. The classes are defined as follows:

Class 1 soils have few limitations that restrict their use.

Class 2 soils have moderate limitations that reduce the choice of plants or that require moderate conservation practices.

Class 3 soils have severe limitations that reduce the choice of plants or that require special conservation practices, or both.

Class 4 soils have very severe limitations that reduce the choice of plants or that require very careful management, or both.

Class 5 soils are not likely to erode but have other limitations, impractical to remove, that limit their use.

Class 6 soils have severe limitations that make them generally unsuitable for cultivation.

Class 7 soils have very severe limitations that make them unsuitable for cultivation.

Class 8 soils and miscellaneous areas have limitations that nearly preclude their use for commercial crop production.

Capability subclasses are soil groups within one class. They are designated by adding a small letter, *e*, *w*, *s*, or *c*, to the class numeral, for example, 2*e*. The letter *e* shows that the main hazard is the risk of erosion unless close-growing plant cover is maintained; *w* shows that water in or on the soil interferes with plant growth or cultivation (in some soils the wetness can be partly corrected by artificial drainage); *s* shows that the soil is limited mainly because it is shallow, droughty, or stony; and *c*, used in only some parts of the United States, shows that the chief limitation is climate that is very cold or very dry.

In class 1 there are no subclasses because the soils of this class have few limitations. Class 5 contains only the subclasses indicated by *w*, *s*, or *c* because the soils in class 5 are subject to little or no erosion. They have other limitations that restrict their use to pasture, rangeland, wildlife habitat, or recreation.

The capability classification of each map unit is given in the section “Detailed Soil Map Units” and in table 5.

Prime Farmland

Prime farmland is one of several kinds of important farmland defined by the U.S. Department of Agriculture. It is of major importance in meeting the Nation’s short- and

long-range needs for food and fiber. Because the supply of high-quality farmland is limited, the U.S. Department of Agriculture recognizes that responsible levels of government, as well as individuals, should encourage and facilitate the wise use of our Nation's prime farmland.

Prime farmland, as defined by the U.S. Department of Agriculture, is land that has the best combination of physical and chemical characteristics for producing food, feed, forage, fiber, and oilseed crops and is available for these uses. It could be cultivated land, pastureland, forest land, or other land, but it is not urban or built-up land or water areas. The soil qualities, growing season, and moisture supply are those needed for the soil to economically produce sustained high yields of crops when proper management, including water management, and acceptable farming methods are applied. In general, prime farmland has an adequate and dependable supply of moisture from precipitation or irrigation, a favorable temperature and growing season, acceptable acidity or alkalinity, an acceptable salt and sodium content, and few or no rocks. It is permeable to water and air. It is not excessively erodible or saturated with water for long periods, and it either is not frequently flooded during the growing season or is protected from flooding. The slope ranges mainly from 0 to 5 percent. More detailed information about the criteria for prime farmland is available at the local office of the Natural Resources Conservation Service.

The map units in the survey area that are considered prime farmland are listed at the end of this section. This list does not constitute a recommendation for a particular land use. On some soils included in the list, measures that overcome a hazard or limitation, such as flooding, wetness, and droughtiness, are needed. Onsite evaluation is needed to determine whether or not the hazard or limitation has been overcome by corrective measures. The extent of each listed map unit is shown in table 4. The location is shown on the detailed soil maps. The soil qualities that affect use and management are described under the heading "Detailed Soil Map Units."

The map units that meet the requirements for prime farmland are:

BaB	Bastrop fine sandy loam, 1 to 3 percent slopes
BeB	Benchley clay loam, 1 to 3 percent slopes
BeC	Benchley clay loam, 3 to 5 percent slopes
BuA	Burleson clay, 0 to 1 percent slopes
ChC	Chazos loamy fine sand, 1 to 5 percent slopes
CoA	Coarsewood silt loam, 0 to 1 percent slopes, rarely flooded
CoB	Coarsewood silt loam, 1 to 3 percent slopes, rarely flooded
DmB	Dimebox clay, 1 to 3 percent slopes
GsB	Gasil loamy fine sand, 1 to 5 percent slopes
HsA	Highbank silty clay loam, 0 to 1 percent slopes, rarely flooded
LeC	Lexton clay loam, 3 to 5 percent slopes
LuB	Luling clay, 1 to 3 percent slopes
LuC	Luling clay, 3 to 5 percent slopes
MgB	Margie fine sandy loam, 1 to 3 percent slopes
RaA	Rader fine sandy loam, 0 to 2 percent slopes
RsC	Rosanky fine sandy loam, 2 to 5 percent slopes
ShA	Ships clay, 0 to 1 percent slopes, rarely flooded
ShB	Ships clay, 1 to 3 percent slopes, rarely flooded
SmC	Silawa loamy fine sand, 2 to 5 percent slopes
SpB	Spiller fine sandy loam, 1 to 3 percent slopes
WeA	Weswood silt loam, 0 to 1 percent slopes, rarely flooded
WwA	Weswood silty clay loam, 0 to 1 percent slopes, rarely flooded
WwB	Weswood silty clay loam, 1 to 3 percent slopes, rarely flooded
YaA	Yahola fine sandy loam, 0 to 2 percent slopes, rarely flooded

Rangeland

Homer Sanchez, State Range Conservationist, Natural Resources Conservation Service, Temple, Texas, prepared this section.

Rangeland is defined as land on which the native vegetation (the potential natural plant community) is predominantly grasses, grass-like plants, forbs, or shrubs. Rangeland includes natural grasslands, savannahs, most deserts, tundra, coastal marshes, and wet meadows. Rangeland receives no regular or frequent cultural treatment.

Rangeland makes up the majority of the land in Robertson County. The rangeland is used primarily for grazing by livestock; however, its use as wildlife habitat is becoming increasingly important as more landowners choose to lease hunting rights and develop recreational activities for additional sources of income.

The rangeland in Robertson County is located within two major land resource areas (MLRAs). These areas are the Southern Claypan Area and the Southern Blackland Prairie. The Southern Claypan Area covers about 80 percent of Robertson County. The Southern Blackland Prairie makes up the remaining 20 percent and covers an area several miles wide that runs parallel to the southern boundary of the county. Soils of the Southern Claypan Area typically have clayey subsoils overlain by sandy or loamy surface layers. Soils of the Southern Blackland Prairie are darker and generally are clayey throughout.

Few ranchers depend exclusively on rangeland to feed livestock. Although range vegetation often contributes significant amounts of forage during winter months, it is supplemented by protein concentrates and small grain pastures. True native vegetation in most of the county grows only in small blocks less than 25 acres in size. These areas of rangeland, for the most part, are depleted in forage productivity because of improper grazing management and the invasion of woody or weedy vegetation, or both, which reduce the quality and quantity of suitable forage plants. Much of the acreage classified as rangeland is abandoned cropland or pastureland and, due to lack of management, these acres generally produce less than half their original potential. On most of the rangeland, the dominant grasses are Texas wintergrass, dropseeds, species of windmillgrass, threeawns, and little bluestem. Some introduced grasses, such as King Ranch bluestem and common bermudagrass, have invaded or survived prior management. *Paspalum* dominates many sites in the Southern Claypan Area. Texas wintergrass and meadow dropseed are dominant on many of the soils in the Southern Blackland Prairie. Honey mesquite is the dominant woody invader on abandoned cropland or pastureland.

In areas that have similar climate and topography, differences in the kind and amount of vegetation produced on rangeland are closely related to the kind of soil. Soils that produce about the same kinds, amounts, and proportions of forage are grouped into an ecological site.

An ecological site is the product of all the environmental factors responsible for its development. It has characteristic soils, which have developed over time throughout the soil development process; a characteristic hydrology, particularly the infiltration and runoff rates that have developed over time; and a characteristic plant community (including kind and amount of vegetation). The hydrology of a site is influenced by development of the soil and plant community. The vegetation, soils, and hydrology are all interrelated factors. Each factor is influenced by the others. The plant community on an ecological site is typified by an association of species that differs from that of other ecological sites in the kind and/or proportion of species or in total production.

Range management requires a knowledge of soils, plants, animals, and the practices used to manage them. Range similarity index, rangeland trend, and rangeland health are three separate tools used to measure resource integrity on rangeland. Range similarity index is determined by comparing the present plant

community with the potential natural plant community on an ecological site. The more closely the existing community resembles the potential community, the higher the range similarity index. Rangeland trend is defined as the direction of change in an existing plant community relative to the potential natural plant community. Rangeland health is a determination of how the ecological processes on an ecological site are functioning. Ecological processes evaluated include the water cycle, nutrient cycle, and energy flow. Further information about the range similarity index, rangeland trend, and rangeland health is available in chapter 4 of the "National Range and Pasture Handbook" (available at <http://www.ftw.nrcs.usda.gov/glti/NRPH.html>).

Nearly all plant communities have undergone changes over time. Many years of continuous livestock grazing, the absence of fire, the invasion of plants that were not originally in the plant community, and climatic events, such as major droughts, have all interacted to affect changes in the vegetation on rangeland. Some changes are not reversible without major inputs.

Abnormal disturbances that change the potential natural plant community include repeated overuse by livestock, excessive burning, erosion, and plowing. Grazing or browsing animals select the most palatable plants. The abundance of these plants declines if they are continually grazed at a severity that does not allow for recovery. Less desirable plants, such as annuals and weed-like plants can then increase. This degradation process typically takes several years. With proper grazing management, high-quality native plants can return, unless the plant community and soils have significantly degraded.

The objective in range management is to manage for ecological integrity. A range similarity index somewhat below the potential can meet grazing needs, provide wildlife habitat, and protect soil and water resources. Landowner objectives dictate the desired plant community as long as the resource is not deteriorating.

The primary range management practices used in Robertson County include prescribed grazing, stock-water developments, and fences. If undesirable plants become dominant, range seeding, brush management, and prescribed burning are commonly used.

Grazing management should be flexible and closely correlated to plant growth curves and to fluctuations in seasonal and annual forage production. A typical growth curve for native vegetation representing the percentage of total growth occurring each month for the county would be as follows:

Jan.	Feb.	Mar.	Apr .	May	June	Jul.	Aug.	Sept.	Oct.	Nov.	Dec.
1	2	5	12	20	25	8	5	10	8	3	1

Approximately 65 percent of the annual production of forage occurs in April through July because of the response to spring and early summer rains. A second smaller growth period may occur in the fall if sufficient moisture is available.

Table 6 shows, for each soil that supports rangeland vegetation, the ecological site and the total air-dry-weight production of vegetation in favorable, normal, and unfavorable years. An explanation of the column headings in table 6 follows.

An ecological site is indicated for each soil map unit listed in the table. A description of each ecological site is at the end of this section.

Total dry-weight production is the amount of vegetation that can be expected to grow annually, averaged over time, on well managed rangeland that is supporting the potential natural plant community. It includes all vegetation, whether or not it is palatable to grazing animals. It includes the current year's growth of leaves, twigs, and fruits of woody plants. It does not include the increase in stem diameter of trees and shrubs. It is expressed in pounds per acre of air-dry vegetation for favorable, normal, and unfavorable years. In a favorable year, the amount and distribution of precipitation and the temperatures make growing conditions substantially better than average. In a

normal year, growing conditions are about average. In an unfavorable year, growing conditions are well below average, generally because of low available soil moisture. Yields are adjusted to a common percent of air-dry moisture content.

Ecological Sites

Following is a description of the two types of major land resource areas in Robertson County and the ecological sites within each.

Southern Blackland Prairie Major Land Resource Area

This part of the county has predominantly clayey soils that have the potential to support tall grasses and a climax plant community, or a potential natural plant community, that is dominantly a tall grass prairie. Historically, this area characteristically maintained a mixture of tall grasses, such as big bluestem, little bluestem, switchgrass, indiagrass, Virginia wildrye, and some eastern gamagrass. Mid grasses include such species as sideoats grama, tall dropseed, and Texas wintergrass. Interspersed areas of trees are typically along major drainageways and in some areas in mottes.

The Southern Blackland Prairie rangeland is divided into 5 ecological sites that include Blackland, Clay Loam, Clayey Bottomland, Claypan Prairie, and Loamy Bottomland.

Blackland Ecological Site. Burleson, Dimebox, and Luling soils are in this ecological site. The climax vegetation is a tall grass prairie where a few large live oaks, elm, and hackberry trees are along drainageways and in mottes. The composition, by weight, is 85 percent grasses, 5 percent woody plants, and 10 percent forbs. This site has high natural fertility. Little bluestem, indiagrass, and big bluestem produce 75 percent of the forage under climax vegetation. Other grasses, such as switchgrass, sideoats grama, Texas wintergrass, Texas cupgrass, tall dropseed, Florida paspalum, and Virginia wildrye, make up 10 percent. Woody plants are live oak, elm, hackberry, bumelia, and coralberry. Many palatable forbs and legumes are native to this site.

Overgrazing by cattle eventually kills tall grasses, such as big bluestem, indiagrass, switchgrass, and eastern gamagrass. These grasses are replaced by silver bluestem, Texas wintergrass, tall dropseed, and other mid grasses. If grazing pressure continues, buffalograss, Texas grama, tumblegrass, annual weeds, and annual grasses dominate the site and noxious brush plants, such as mesquite, winged elm, retama, baccharis, and huisache, invade.

Clay Loam Ecological Site. Benchley soils are in this site. In pristine condition, this is a highly productive, true tall grass prairie site. The composition, by weight, is 90 percent grasses, 5 percent woody plants, and 5 percent forbs. Little bluestem dominates the site, constituting 40 to 50 percent of the total annual yield. Indiagrass, big bluestem, switchgrass, Virginia wildrye, Canada wildrye, and Florida paspalum make up about 30 percent. Sideoats grama, silver bluestem, low panicums, and Texas wintergrass make up about 15 percent. Short grasses make up about 5 percent. Woody plants include hackberry, elm, pecan, and oak. The primary forbs are Maximilian sunflower, Engelmann daisy, penstemon, bundleflower, and numerous other legumes.

As retrogression occurs due to overgrazing, tall grasses, such as bluestems, indiagrass, switchgrass, and Florida paspalum, decrease in abundance and are replaced by sideoats grama, silver bluestem, low panicums, Texas wintergrass, and tall dropseed. In a deteriorated condition, total production potential is reduced by invader plants, such as threeawns, hairy grama, red lovegrass, Texas grama, buffalograss, tumblegrass, western ragweed, broomweed, and prairie coneflower, and by dominant woody plants, such as mesquite, baccharis, yaupon, and hawthorn.

Clayey Bottomland Ecological Site. Navasota, Oletha, Roetex, Ships, and Zilaboy

soils are in this site. The climax plant community is a tall grass savannah. Oak, elm, hackberry, cottonwood, ash, black willow, some pecan, and other large trees make up about 25 percent of the canopy cover. The canopy generally is heavier along streams or drainageways. Cool-season grasses and sedges grow under the canopy, and warm-season grasses and forbs dominate the open areas. The composition, by weight, is 70 percent grasses, 25 percent woody plants, and 5 percent forbs.

Sedges, Virginia wildrye, Canada wildrye, and rustyseed paspalum produce 15 percent of the composition, by weight. Beaked panicum, switchgrass, indiagrass, vine mesquite, Florida paspalum, and other grasses produce 50 percent. Buffalograss, longleaf uniola, knotroot bristlegrass, and other grasses produce about 5 percent. The forbs are tickclover, snoutbean, lespedeza, and gayfeather.

This is a site preferred by livestock. Heavy grazing and fire suppression reduce the amount of warm-season grasses and forbs and allow the brush to form a dense canopy. Shade-tolerant grasses then dominate the understory, drastically reducing the total usable forage. Bermudagrass and buffalograss often invade closely grazed open areas.

Claypan Prairie Ecological Site. Bremond, Crockett, and Wilson soils are in this site. In climax condition, this site consists of a true tall grass prairie or a very open savannah. Oak, elm, and hackberry trees are along drainageways or in mottes. The composition, by weight, is 85 percent grasses, 10 percent forbs, and 5 percent woody plants.

Little bluestem and indiagrass compose 65 percent of the climax plant community. Switchgrass, big bluestem, Virginia wildrye, Canada wildrye, Florida paspalum, sideoats grama, meadow dropseed, Texas wintergrass, and vine mesquite make up about 15 percent. Purpletop, brownseed paspalum, longspike tridens, buffalograss, low panicums, fall switchgrass, and sedges make up 5 percent. Live oak, elm, hackberry, bumelia, coralberry, and a few post oak make up 5 percent of the total production. Many forbs, such as Maximilian sunflower, Engelmann daisy, halfshrub sundrop, western indigo, and prairie clover, make up 10 percent of the composition.

Continued overgrazing by cattle decreases the extent of big bluestem, little bluestem, indiagrass, and switchgrass. Meadow dropseed, silver bluestem, sideoats grama, and Texas wintergrass increase in abundance. Eventually, mesquite and pricklypear invade and buffalograss, Texas wintergrass, Texas grama, windmillgrass, and weedy forbs dominate the site.

Loamy Bottomland Ecological Site. Coarsewood, Highbank, Sandow, Uhland, Weswood, Whitesboro, and Yahola soils are in this site. This site is also within the Southern Claypan Area Major Land Resource Area. The climax plant community is a tall grass savannah where trees shade 30 to 40 percent of the ground. Overstory consists of oaks, pecan, hackberry, elm, cottonwood, and hickory or ash trees. Understory plants are hawthorns, greenbrier, honeysuckle, grapes, and peppervines. Cool-season grasses and sedges dominate the shaded areas, and warm-season grasses dominate the openings. The composition, by weight, is 70 percent grasses, 25 percent woody plants, and 5 percent forbs.

Virginia wildrye, sedges, and rustyseed paspalum grow in the shaded and wet areas and make up 25 percent of the composition. Switchgrass, beaked panicum, indiagrass, big bluestem, little bluestem, eastern gamagrass, vine mesquite, and purpletop grow in the open areas and make up 35 percent of the plant community. Redtop panicum, gaping panicum, low panicums, uniolas, buffalograss, knotroot bristlegrass, Texas wintergrass, and other grasses make up 10 percent. The forbs are tickclover, lespedeza, snoutbean, partridge pea, and gayfeather.

This site is preferred by livestock. Overgrazing and fire suppression reduce the production of warm-season grasses and forbs and increase the extent of the tree and brush canopy. Shade-tolerant grasses and forbs then dominate the herbaceous production, and forage production is drastically reduced.

Southern Claypan Area Major Land Resource Area

Loamy and sandy soils are typical of this part of Robertson County. The majority of this major land resource area is in rangeland and in improved pastureland. There are significant areas in cultivation or in woodland. The climax plant community generally is a post oak and blackjack oak savannah. In climax, trees shade as much as 15 to 20 percent of the ground on uplands. Large trees such as oaks, American elm, and hackberry form a dense overstory along major drainageways. Mid to tall grasses dominate the understory. As retrogression or deterioration occurs, woody plants invade and tall grasses are replaced by mid to short grasses and forbs, which are less productive and less nutritious to livestock.

Ten different ecological sites are within the Southern Claypan Area. They are Claypan Savannah, Deep Redland, Deep Sand, Loamy Bottomland, Sandstone Hill, Sandy, Sandy Bottomland, Sandy Loam, Very Deep Sand, and Wet Sandy Draw.

Claypan Savannah Ecological Site. Edge and Lufkin soils are in this ecological site. The climax plant community is a post oak and blackjack oak savannah where trees shade 15 to 20 percent of the ground. The composition, by weight, is about 80 percent grasses, 15 percent woody plants, and 5 percent forbs.

About 60 percent of the climax vegetation is made up of little bluestem, indiangrass, and brownseed paspalum. The other grasses are switchgrass, Florida paspalum, purpletop, low panicums, low paspalums, silver bluestem, tall dropseed, and Texas wintergrass. Woody plants include post oak, blackjack oak, elm, yaupon, hawthorn, and American beautyberry. Forbs include dayflower, bundleflower, sensitive brier, tickclover, wildbean, and lespedeza.

If retrogression occurs as a result of heavy grazing or fire suppression, or both, little bluestem, indiangrass, and switchgrass are replaced by brownseed paspalum, silver bluestem, arrowfeather threeawn, tall dropseed, purpletop, and low panicums. Woody plants, such as post oak, elm, yaupon, and hackberry, increase in abundance and form a dense canopy that suppresses grass and forb production.

Deep Redland Ecological Site. Lexton and Margie soils make up this site. In pristine condition this site is an oak savannah. Post oak and blackjack oak shade about 20 percent of the ground. The climax plant community consists of about 80 percent grasses, 15 percent woody plants, and 5 percent forbs.

Little bluestem dominates the understory and can account for as much as 40 to 50 percent of the total annual production. Indiangrass and beaked panicum are subdominant, producing about 20 percent. In lesser amounts are big bluestem, Florida paspalum, purpletop, and longleaf uniola.

As retrogression occurs, woody plants often increase in abundance along with shade-tolerant grasses, such as sedges and uniolas. Invaders to this site are broomsedge bluestem, red lovegrass, arrowfeather threeawn, frogfruit, bitter sneezeweed, broomweed, winged elm, sesbania baccharis, and persimmon. If the site is invaded, grazeable forage declines considerably and shrub and woody production increases. All or part of this growth can be unpalatable to or out of reach of grazing animals.

Deep Sand Ecological Site. Desan, Eufaula, and Padina soils are in this ecological site. The climax vegetation is a post oak and blackjack oak savannah where the canopy makes up 20 to 25 percent. The understory consists of mid to tall grasses. The composition, by weight, is 80 percent grasses, 15 percent woody plants, and 5 percent forbs.

Little bluestem makes up about 50 percent of the composition, and indiangrass makes up about 10 percent. Also present in lesser amounts are purpletop, switchgrass, and sand lovegrass. Other grasses are low panicums, purple lovegrass, sand dropseed, brownseed paspalum, and splitbeard bluestem. Woody plants, such as blackjack oak and post oak, make up 10 percent of the composition. Other woody plants include shrubs, such as yaupon, hawthorn, and American beautyberry, which

make up the understory. Forbs include legumes such as lespedeza, tickclover, and partridge pea.

As retrogression takes place, little bluestem, sand lovegrass, indiagrass, and purpletop decrease in abundance and low panicums, low paspalums, purple lovegrass, and woolysheath threeawn increase. Oak and yaupon increase to form a dense canopy. The decreasing and increasing plants are eventually replaced by red lovegrass, tumble lovegrass, crabgrass, red sprangletop, sandbur, brackenfern, pricklypear, and queensdelight. Forage plants are then virtually eliminated.

Loamy Bottomland Ecological Site. Coarsewood, Highbank, Sandow, Uhland, Weswood, Whitesboro, and Yahola soils are in this site. This site is also within the Southern Blackland Prairie Major Land Resource Area. The climax plant community is a tall grass savannah where trees shade 30 to 40 percent of the ground. Overstory consists of oaks, pecan, hackberry, elm, cottonwood, and hickory or ash trees. Understory plants are hawthorns, greenbrier, honeysuckle, grapes, and peppervines. Cool-season grasses and sedges dominate the shaded areas, and warm-season grasses dominate the openings. The composition, by weight, is 75 percent grasses, 20 percent woody plants, and 5 percent forbs.

Virginia wildrye, sedges, and rustyseed paspalum grow in the shaded and wet areas and make up 25 percent of the composition. Switchgrass, beaked panicum, indiagrass, big bluestem, little bluestem, eastern gamagrass, vine mesquite, and purpletop grow in the open areas and make up 35 percent of the plant community. Redtop panicum, gaping panicum, low panicums, uniolas, buffalograss, knotroot bristleglass, Texas wintergrass, and other grasses make up 15 percent. The forbs are tickclover, lespedeza, snoutbean, partridge pea, and gayfeather.

This site is preferred by livestock. Overgrazing and fire suppression reduce the production of warm-season grasses and forbs and increase the extent of the tree and brush canopy. Shade-tolerant grasses and forbs then dominate the herbaceous production, and forage production is drastically reduced.

Sandstone Hill Ecological Site. Hearne soils are in this ecological site. The climax plant community is made up of a moderate-sized post oak, live oak, blackjack oak, and hickory tree savannah along with an open stand of mid to tall grasses. The composition, by weight, is 70 percent grasses, 10 percent forbs, and 20 percent woody plants.

Open areas are dominated by grasses, such as little bluestem, sideoats grama, tanglehead, and silver bluestem. Forbs, legumes, woody vines, and shrubs add variety to the climax plant community.

As retrogression occurs, the surface compacts, causing sheet erosion as the amount of bare ground increases. The tall grasses decrease in abundance and are replaced by less palatable and robust plants, such as annual threeawn, red lovegrass, and gummy lovegrass. Understory brush, such as American beautyberry and yaupon, can invade the more wooded areas. The landscape can be beautifully decorated with flowering plants like bluebonnets, Indian paintbrush, liatris, and primroses. Unique to this site is the abundance of irregularly shaped rocks on the surface.

Sandy Ecological Site. Dutek, Robco, and Silstid soils are in this ecological site. The climax vegetation is an open savannah of post oak and blackjack oak, which shades 20 to 25 percent of the ground. Tall grasses are predominantly in the inner spaces. The composition, by weight, is 80 percent grasses, 15 percent woody plants, and 5 percent forbs.

About 50 percent of the composition is little bluestem, and 10 percent is indiagrass. The composition of switchgrass, beaked panicum, sand lovegrass, purpletop, and brownseed paspalum totals 10 percent. Other grasses are fringleaf paspalum, purple lovegrass, tall dropseed, splitbeard bluestem, and low panicums. Post oak and blackjack oak make up about 10 percent of the total annual production. Woody plants in the understory are hawthorn, American beautyberry, greenbrier,

yaupon, and berry vines. The forbs are lespedeza, tickclover, sensitive brier, snoutbean, tephrosia, partridge pea, and western ragweed.

With continuous overgrazing and a lack of natural fires, the taller grasses are grazed out or shaded out, or both, by an increasing canopy of woody plants. Little bluestem, indiangrass, and switchgrass are replaced by brownseed paspalum, tall dropseed, fall witchgrass, and other increaser plants. These plants, in turn, are grazed out and replaced by red lovegrass, yankeeweed, bullnettle, snakecotton, and croton. Other invading plants are broomsedge bluestem, smutgrass, sandbur, pricklypear, queensdelight, beebalm, pricklepoppy, baccharis, and waxmyrtle. Woody plants increase and invade, forming dense thickets.

Sandy Bottomland Ecological Site. Gaddy soils are in this ecological site. The climax vegetation is a tall grass savannah that has as much as a 20 percent canopy. Live oak, cottonwood, and other large trees dominate the overstory. Little bluestem, indiangrass, and switchgrass make up about 60 percent of the herbaceous plant community. The composition, by weight, is about 75 percent grasses, 20 percent woody plants, and 5 percent forbs.

If regression occurs as a result of heavy grazing, the better grasses are replaced by less palatable plants, such as Pan American balsamscale, knotroot bristlegrass, and red lovegrass. With continued land abuse, mesquite, grass bur, bullnettle, willows, and short grasses, such as hairy grama, significantly increase in abundance.

Sandy Loam Ecological Site. Bastrop, Chazos, Gasil, Hearne, Rader, Rosanky, Silawa, Spiller, and Tabor soils are in this ecological site. The climax plant community is a post oak and blackjack oak savannah that has a 20 to 25 percent canopy. The understory consists of mid and tall grasses and is dominated by little bluestem, which makes up 50 percent of the composition. The total composition, by weight, is 80 percent grasses, 15 percent woody plants, and 5 percent forbs.

Little bluestem, the dominant grass, and indiangrass make up about 60 percent of the total composition. Eastern gamagrass, switchgrass, big bluestem, beaked panicum, and longleaf uniola make up 10 percent. Numerous other grasses collectively make up about 10 percent. Post oak and blackjack oak make up about 10 percent of the total annual production. Numerous other woody plants include elm, yaupon, greenbrier, American beautyberry, and dewberry vines. The forbs include Engelmann daisy, gayfeather, sensitive briar, and native legumes.

In a situation where wildfires are few and overgrazing is continual, this ecological site deteriorates and exhibits an increase in woody canopy and a decline in the extent of tall grasses, such as little bluestem, indiangrass, big bluestem, and eastern gamagrass. These plants are replaced by such plants as brownseed paspalum. If overgrazing persists, the site deteriorates to thickets of oak and brush, annual grasses, forbs, and carpetgrass.

Very Deep Sand Ecological Site. Arenosa soils are in this ecological site. The climax plant community is a savannah. Bluejack oak, blackjack oak, and hickory produce a canopy that makes up as much as 30 percent. Scattered yaupon and other shrubs make up a secondary canopy. The composition, by weight, is 75 percent grasses, 20 percent woody plants, and 5 percent forbs.

In open areas, the grass composition consists of about 35 percent little bluestem and pinehill bluestem. Mid and short grasses, such as red lovegrass, purple lovegrass, sand lovegrass, dropseeds, and threeawns occupy the spaces between tall grasses, such as bluestems and indiangrass. Under tree canopies, the dominant grasses are slender indiangrass, purpletop tridens, and longleaf uniola.

Grazing pressure causes a decrease in the amount of tall grass vegetation and an increase the extent of mid and short grass plants. Low panicums, low paspalums, and woolysheath threeawn continue to flourish as overgrazing occurs. As a final result of continuous overuse, the areas beneath tree canopies deteriorate to bare ground or to a sparse cover of small forbs and invader grasses, such as red sprangletop, sandbur,

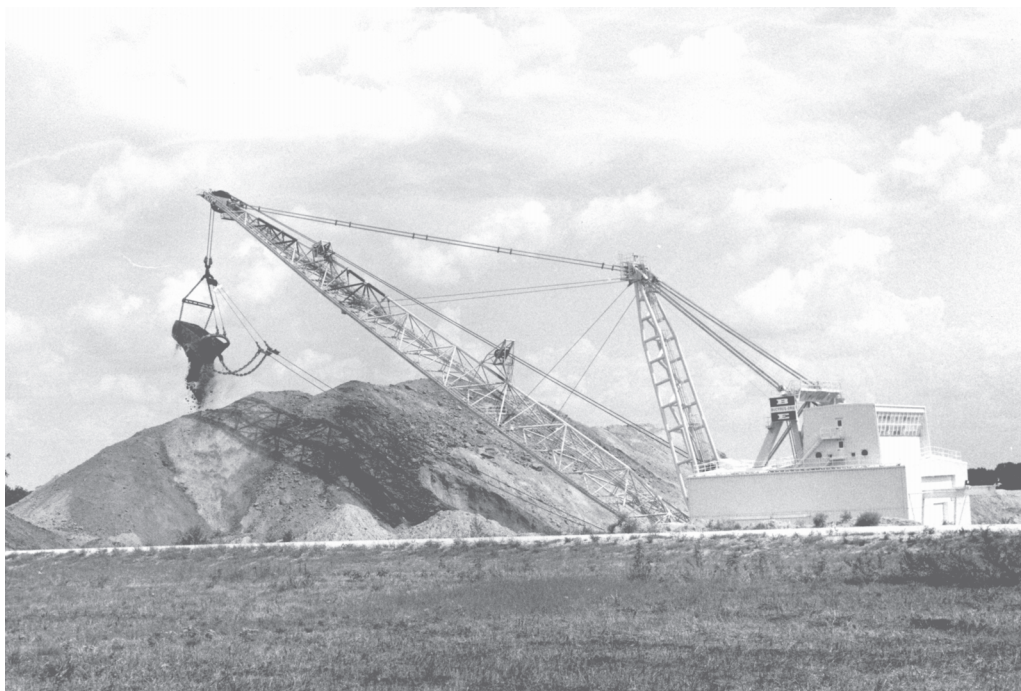


Figure 16.—A walking dragline removes soil over seams of lignite in an area of Edge fine sandy loam, 1 to 5 percent slopes.

purple sandgrass, and curly threeawn. Shrub vegetation can produce as much as a 60 percent canopy.

Wet Sandy Draw Ecological Site. Cadelake soils are in this ecological site. The climax plant community is prairie and is about 90 percent grasses, 5 percent woody plants, and 5 percent forbs.

About 70 percent of the climax plant community is switchgrass, vaseygrass, maidencane, little bluestem, indiagrass, and big bluestem. Other grasses include sedges, broomsedge bluestem, arrowfeather threeawn, rushes, Scribner panicum, and low panicums. Forbs include aster, goldenrod, smartweed, ironweed, berry vines, greenbrier, honeysuckle, waxmyrtle, and willow.

Under continuous overuse, the tall grasses, such as bluestems, switchgrass, and maidencane, decrease in abundance and are replaced by less palatable and productive plants, such as broomsedge bluestem, arrowfeather threeawn, and sedges. If heavy use continues, woody plants, such as waxmyrtle, berry vines, greenbrier, yaupon, and honeysuckle, increase in abundance and form a dense canopy, especially along the outer boundaries of the site.

Surface Mine Reclamation

Norman Bade, Resource Conservationist, Natural Resources Conservation Service, helped prepare this section.

Lignite deposits underlie a large area of Robertson County (fig. 16). Each year, strip mining of this lignite disturbs large areas of land. The mining process includes clearing existing vegetation, removing all overburden, mining the lignite, and replacing the mixed overburden.

Current Texas regulations require that all lignite mined soils be reclaimed according to a pre-approved plan which includes revegetation of the area. The vegetation must

be maintained for a designated period of time. National and State regulations should be considered in the planning, site selection and design, and application of any reclamation procedures.

Land reclamation reconstruction and revegetation of mined areas are important.

After replacing the overburden, the spoil is graded to its planned contour and revegetated according to established regulations. Vegetation must be well established before reclamation is completed. Following reclamation, land can be used for cropland, pasture, rangeland, wildlife habitat, recreational areas, woodland, orchards, or residential or industrial development. The post-mined land use that is selected determines which reclamation procedures should be used and the kinds of plants that should be established.

Successful reclamation requires an understanding of the chemical, physical, and biological properties of soils. The soil properties generally are altered when the soil is disturbed. This can affect the alternative land use and productivity. The reclamation process generally requires a higher than normal amount of soil amendments, seeds and sprigs, and subsequent management.

The objectives of reclamation are to restore the soil to a condition capable of its intended use, to prevent permanent damage, and to control erosion and sedimentation.

Surface mining and reconstruction alter soil properties and can cause an initial increase in the erosion potential, a decrease in soil fertility, and a strong tendency for crusting. Consequently, the method of soil reconstruction is important to the success of reclamation efforts. Methods used in the removal of overburden and reconstruction should place soil material on the surface that is best for plant growth and productivity and assure that geologic materials containing acid-forming pyrites are not mixed into the rooting zone. Chemical testing is needed to ensure that these materials are not present in the reconstructed soil.

The revegetation of mined lands requires a good seedbed, adequate amounts of fertilizer, and selection of plant species that help to control erosion and provide for the land's intended use. Plants commonly used for cover and forage include coastal bermudagrass, common bermudagrass, selection 75 kleingrass, Pensacola bahiagrass, and King Ranch bluestem. Other important species include Haskell sideoats grama, T-587 old world bluestem, Alamo switchgrass, and Lometa indiangrass.

Planting legumes, such as Yuchii arrowleaf clover, crimson clover, subterranean clover, and hairy vetch, increases forage capabilities and provides nitrogen to the soil. Other forbs and legumes, such as Sabine Illinois bundleflower, singletary pea, Engelmann daisy, and Aztec Maximilian sunflower, provide a diversity of forage and improve wildlife habitat. The addition of trees, shrubs, and vines also enhances wildlife habitat.

Recreation

John C. Copeland, Area Resource Conservationist, Natural Resources Conservation Service, helped prepare this section.

Because of the location, climate, topography, and natural resources in Robertson County, there is a high potential for numerous outdoor recreational activities. The county is about a 1-hour drive from Waco, a 2-hour drive from Austin, and a 2.5-hour drive from Houston. Pleasant daytime temperatures and cool nights favor summer activities. The mean temperature and rainfall of the county are favorable when compared to the three major metropolitan areas. Winter weather typically has mild temperatures and little snowfall. However, several cold fronts severe enough to restrict outside recreational activity for a few days move through the survey area in winter.

Rolling terrain and a variety of vegetative patterns contribute to the esthetic visual quality of the area.

Lake Limestone, a 13,680-acre reservoir, bounds the county on the northeast corner and provides multiple recreational opportunities, including fishing, boating, swimming, and nature study. Camp Creek Lake, a 778-acre private lake, along with other private lakes, provide numerous recreational opportunities for landowners.

Robertson County is bordered on the east by the Navasota River and on the west by the Brazos River. Both rivers provide fishing and nature study.

Numerous hunting opportunities are available on private land. Game includes white-tailed deer, dove, squirrel, and feral hogs.

The soils of the survey area are rated in table 7 according to limitations that affect their suitability for recreation. The ratings are based on restrictive soil features, such as wetness, slope, and texture of the surface layer. Susceptibility to flooding is considered. Not considered in the ratings, but important in evaluating a site, are the location and accessibility of the area, the size and shape of the area and its scenic quality, vegetation, access to water, potential water impoundment sites, and access to public sewer lines. The capacity of the soil to absorb septic tank effluent and the ability of the soil to support vegetation are also important. Soils subject to flooding are limited for recreational uses by the duration and intensity of flooding and the season when flooding occurs. In planning recreational facilities, onsite assessment of the height, duration, intensity, and frequency of flooding is essential.

In table 7, the degree of soil limitation is expressed as slight, moderate, or severe. *Slight* means that soil properties are generally favorable and that limitations are minor and easily overcome. *Moderate* means that limitations can be overcome or alleviated by planning, design, or special maintenance. *Severe* means that soil properties are unfavorable and that limitations can be offset only by costly soil reclamation, special design, intensive maintenance, limited use, or a combination of these measures.

The information in table 7 can be supplemented by other information in this survey, for example, interpretations for septic tank absorption fields in table 10 and interpretations for dwellings without basements and for local roads and streets in table 9.

Camp areas require site preparation, such as shaping and leveling the tent and parking areas, stabilizing roads and intensively used areas, and installing sanitary facilities and utility lines. Camp areas are subject to heavy foot traffic and some vehicular traffic. The best soils have mild slopes and are not wet or subject to flooding during the period of use. The surface has few or no stones or boulders, absorbs rainfall readily but remains firm, and is not dusty when dry. Strong slopes and stones or boulders can greatly increase the cost of constructing campsites.

Picnic areas are subject to heavy foot traffic. Most vehicular traffic is confined to access roads and parking areas. The best soils for picnic areas are firm when wet, are not dusty when dry, are not subject to flooding during the period of use, and do not have slopes or stones or boulders that increase the cost of shaping sites or of building access roads and parking areas.

Playgrounds require soils that can withstand intensive foot traffic. The best soils are almost level and are not wet or subject to flooding during the season of use. The surface is free of stones and boulders, is firm after rains, and is not dusty when dry. If grading is needed, the depth of the soil over bedrock or a hardpan should be considered.

Paths and trails for hiking and horseback riding should require little or no cutting and filling. The best soils are not wet, are firm after rains, are not dusty when dry, and are not subject to flooding more than once a year during the period of use. They have moderate slopes and few or no stones or boulders on the surface.

Golf fairways are subject to heavy foot traffic and some light vehicular traffic. Cutting or filling may be required. The best soils for use as golf fairways are firm when wet, are

not dusty when dry, and are not subject to prolonged flooding during the period of use. They have moderate slopes and no stones or boulders on the surface. The suitability of the soil for tees or greens is not considered in rating the soils.

Wildlife Habitat

Mike Stellbauer, Biologist, Natural Resources Conservation Service, Bryan, Texas, prepared this section.

The soil, together with climate, topography, and human influence, directly affects the quality and quantity of the available wildlife habitat in Robertson County.

The Texas Parks and Wildlife Department has identified four major habitat types in Robertson County—post oak woods/grassland mosaic, post oak woods, cropland, and native or introduced grasslands. In addition to these major kinds of habitat, bottomland hardwoods and wooded riparian zones occur along the Brazos, Little Brazos, and Navasota Rivers and their tributaries. Aquatic habitat is in open water and includes Lake Limestone; Twin Oaks Reservoir; Camp Creek Lake; numerous farm ponds; and the Brazos, Little Brazos, and Navasota Rivers and their major tributaries (Pin Oak, Spring, Steele, Duck, Walnut, Mud, and Camp Creeks).

The post oak woods/grassland mosaic habitat and post oak woods habitat generally are on upland soils, such as Arenosa, Edge, Hearne, Padina, Robco, Lexton, and Silstid soils, and are not specific to topography. These sites may range from deep sands to high knobby hills underlain by red sandstone boulders. The woods component of the mosaic includes post oak, blackjack oak, black hickory, winged elm, eastern red cedar, yaupon, greenbrier, rattan, sparkleberry, and coralberry. The grassland component can include native plants, such as little bluestem, yellow indiagrass, arrowfeather threeawn, lespedeza, western ragweed, croton, and tickclover; introduced plants, such as coastal bermudagrass and bahiagrass; or a combination of both. White-tailed deer, wild turkey, fox squirrel, raccoon, opossum, bobcat, northern bobwhite, mourning dove, owls, hawks, woodpeckers, and songbirds live in these habitats.

The habitat quality of the woodland component is influenced by the density of canopy in the overstory and midstory, by livestock grazing management practices, and by the presence or absence of fire. As canopy cover increases, the diversity and quantity of understory plants decrease. Continuous livestock grazing, especially during the winter, also decreases the quality and quantity of understory plants, such as greenbrier, rattan, and yaupon. Selective thinning, creating openings, planting supplemental food plots, prescribed burning, and proper grazing management can improve the quality of this habitat.

The habitat quality of the grassland component is related to the structure and diversity of the grassland plants. This habitat, when occupied by a mixture of native grasses, legumes, forbs, vines, and shrubs, provides fawning cover and forage for white-tailed deer and nesting, feeding, and loafing cover for northern bobwhite and wild turkey. Establishing introduced grasses, such as bermudagrass or bahiagrass, limits the plant diversity and structure needed for deer, turkey, quail, and mourning dove. Introduced bunchgrasses, such as kleingrass or switchgrass, provide better structure and plant diversity. Selective annual disking, selectively controlling shrubs and trees, developing supplemental food plots, using prescribed burning, and using planned grazing management are practices that can improve the structure and diversity of this component.

Two federally listed endangered plants, Navasota lady's-tresses and large fruited sand verbena, and one federally listed endangered animal, Houston toad, are associated with the post oak woods/grassland mosaic.

Additional areas of grassland habitat occur as prairie sites scattered around the county in association with the post oak woods, mainly located along the Old San

Antonio Road at the southern edge of the county. This tall grass prairie provides habitat for deer, wolf, pronghorn, turkey, and the greater prairie chicken in its native state of bluestem grasses and perennial forbs. Much of the prairie is now bermudagrass or bahiagrass pasture, cropland, or low-quality rangeland that is being invaded by mesquite. Deer, feral hogs, turkey, and coyotes inhabit areas along the wooded riparian drainageways that cross the prairie. Prairie soils in the county include Benchley, Crockett, Dimebox, and Luling soils.

Improvement practices applicable to prairie grassland habitats include controlling brush, reestablishing native or introduced bunch grasses, prescribed burning, proper grazing management, establishing annual food plots, establishing perennial legumes and forbs in pastures, and protecting riparian areas.

Wildlife habitat associated with cropland is on the flood plains of the Brazos and Little Brazos Rivers and on various upland soils scattered across the county. Flood-plain cropland soils include Coarsewood, Highbank, Ships, Weswood, and Yahola soils. Terrace cropland soils include Bremond, Burleson, Chazos, Silawa, and Wilson soils. Upland cropland soils include Benchley, Crockett, Dimebox, and Luling soils. Waste grains and seeds from corn, grain sorghum, peanuts, and watermelons, along with associated forbs, such as croton, ragweed, and partridge pea, provide food for turkey, dove, northern bobwhite, songbirds, and waterfowl. White-tailed deer, feral hogs, raccoons, coyotes, fox squirrels, and rabbits also find food and cover in the habitats associated with cropland. Annual cool-season forage crops, such as wheat, oats, and rye grass, provide food for deer, rabbits, geese, and cranes.

Improvement practices applicable to cropland habitats include retaining crop residues on the soil surface and providing unharvested rows of grain crops through the winter months; maintaining forbs, grasses, and shrubs in fence lines and along turning rows; establishing cover crops of small grains or legumes; and constructing shallow water impoundments.

The bottomland hardwood and riparian habitats are on the flood plains and associated terraces of the drainageways in the county. Characteristic soils of these flood plains are Coarsewood, Navasota, Roetex, Sandow, Ships, Uhland, Yahola, Weswood, Whitesboro, and Zilaboy soils. Associated trees and plants on flood plains include pecan, cedar elm, water oak, willow oak, water hickory, cottonwood, ash, hackberry, black willow, yaupon, waxmyrtle, baccharis, Alabama supplejack, greenbrier, and pepper vine. Representative terrace soils include Chazos, Eufaula, and Silawa soils. Trees and plants associated with the terrace soils include post oak, ash, water oak, sycamore, hackberry, yaupon, and American beautyberry.

A change from wooded bottomland to freshwater marsh is common because the population of beavers in the county has increased. Beaver ponds are characterized by open water surrounded by willow, waxmyrtle, cattails, sedges, and rushes.

Flood plains and terraces are some of the most productive wildlife lands in the county and provide habitat for migratory and resident waterfowl, white-tailed deer, feral hog, wild turkey, beaver, raccoon, bobcat, fox squirrels, woodpeckers, and songbirds. Water snakes, frogs, toads, turtles, and salamanders also live on these flood plains and terraces.

Improvement practices applicable to this habitat include selectively thinning hardwoods, reforesting hardwood where needed, properly managing livestock grazing, creating food plots, and installing structures to create shallow water areas for waterfowl.

Lakes, rivers, and creeks, along with the many farm ponds in the county, provide aquatic habitat for largemouth bass; channel, blue, and yellow catfish; crappie; and bluegill sunfish. Beaver, raccoon, blue heron, green heron, common egret, cattle egret, wood ducks, gadwall, ring-necked ducks, mallards, scaup, and redhead ducks also use these aquatic habitats. In addition, farm ponds in the county provide aquatic habitat to upland wildlife. Soils suitable for farm pond construction include Benchley,

Crockett, and Luling soils. Ponds on these soils usually are stocked with largemouth bass, channel catfish, fathead minnows, and bluegill sunfish. The bald eagle, a federally listed threatened species, has been seen in some of the larger open water habitats.

Farm ponds in Robertson County may need agricultural limestone to ensure good productivity. Other practices useful in maintaining or improving quality pond habitat include aquatic weed control, fertilization, proper fish stocking and harvest, the installation of siphon or trickle tubes, and proper grazing use in the pond watershed.

Soils affect the kind and amount of vegetation that is available to wildlife as food and cover. They also affect the construction of water impoundments. The kind and abundance of wildlife depend largely on the amount and distribution of food, cover, and water. Wildlife habitat can be created or improved by planting the appropriate vegetation, by maintaining the existing plant cover, or by promoting the natural establishment of desirable plants.

In table 8, the soils in the survey area are rated according to their potential for providing habitat for various kinds of wildlife. This information can be used in planning parks, wildlife refuges, nature study areas, and other developments for wildlife; in selecting soils that are suitable for establishing, improving, or maintaining specific elements of wildlife habitat; and in determining the intensity of management needed for each element of the habitat.

The potential of the soil is rated good, fair, poor, or very poor. A rating of *good* indicates that the element or kind of habitat is easily established, improved, or maintained. Few or no limitations affect management, and satisfactory results can be expected. A rating of *fair* indicates that the element or kind of habitat can be established, improved, or maintained in most places. Moderately intensive management is required for satisfactory results. A rating of *poor* indicates that limitations are severe for the designated element or kind of habitat. Habitat can be created, improved, or maintained in most places, but management is difficult and must be intensive. A rating of *very poor* indicates that restrictions for the element or kind of habitat are very severe and that unsatisfactory results can be expected. Creating, improving, or maintaining habitat is impractical or impossible.

The elements of wildlife habitat are described in the following paragraphs.

Grain and seed crops are domestic grains and seed-producing herbaceous plants. Soil properties and features that affect the growth of grain and seed crops are depth of the root zone, texture of the surface layer, available water capacity, wetness, slope, surface stoniness, and flooding. Soil temperature and soil moisture are also considerations. Examples of grain and seed crops are corn, grain sorghum, wheat, oats, and ryegrass.

Grasses and legumes are domestic perennial grasses and herbaceous legumes. Soil properties and features that affect the growth of grasses and legumes are depth of the root zone, texture of the surface layer, available water capacity, wetness, surface stoniness, flooding, and slope. Soil temperature and soil moisture are also considerations. Examples of grasses and legumes are kleingrass, clovers, bahiagrass, and alfalfa.

Wild herbaceous plants are native or naturally established grasses and forbs, including weeds. Soil properties and features that affect the growth of these plants are depth of the root zone, texture of the surface layer, available water capacity, wetness, surface stoniness, and flooding. Soil temperature and soil moisture are also considerations. Examples of wild herbaceous plants are indiangrass, bluestems, paspalums, panicums, sunflowers, crotons, and bundleflowers.

Hardwood trees and woody understory produce nuts or other fruit, buds, catkins, twigs, bark, and foliage. Soil properties and features that affect the growth of hardwood trees and shrubs are depth of the root zone, available water capacity, and wetness. Examples of these plants are oak, hawthorn, persimmon, dogwood, hickory, pecan,

and blackberry. Examples of fruit-producing shrubs that are suitable for planting on soils rated *good* are wild plum, mustang grape, and yaupon.

Shrubs are bushy woody plants that produce fruit, buds, twigs, bark, and foliage. Soil properties and features that affect the growth of shrubs are depth of the root zone, available water capacity, salinity, and soil moisture. Examples of shrubs are wild plum, mustang grape, and yaupon.

Wetland plants are annual and perennial wild herbaceous plants that grow on moist or wet sites. Submerged or floating aquatic plants are excluded. Soil properties and features affecting wetland plants are texture of the surface layer, wetness, reaction, salinity, slope, and surface stoniness. Examples of wetland plants are smartweed, wild millet, rushes, sedges, and reeds.

Shallow water areas have an average depth of less than 5 feet. Some are naturally wet areas. Others are created by dams, levees, or other water-control structures. Soil properties and features affecting shallow water areas are depth to bedrock, wetness, surface stoniness, slope, and permeability. Examples of shallow water areas are marshes, waterfowl feeding areas, and ponds.

The habitat for various kinds of wildlife is described in the following paragraphs.

Habitat for openland wildlife consists of cropland, pasture, meadows, and areas that are overgrown with grasses, forbs, shrubs, and vines. These areas produce grain and seed crops, grasses and legumes, and wild herbaceous plants. Wildlife attracted to these areas include northern bobwhite, meadowlark, field sparrow, cottontail, and coyote.

Habitat for woodland wildlife consists of areas of deciduous plants and associated grasses, legumes, and wild herbaceous plants. Wildlife attracted to these areas include wild turkey, woodpeckers, squirrels, gray fox, raccoon, deer, and feral hogs.

Habitat for wetland wildlife consists of open, marshy or swampy shallow water areas. Some of the wildlife attracted to such areas are egrets, ducks, geese, herons, shore birds, nutria, and beaver.

Habitat for rangeland wildlife consists of areas of shrubs and wild herbaceous plants. Wildlife attracted to rangeland include deer, dove, meadowlark, and northern bobwhite.

Engineering

This section provides information for planning land uses related to urban development and to water management. Soils are rated for various uses, and the most limiting features are identified. Ratings are given for building site development, sanitary facilities, construction materials, and water management. The ratings are based on observed performance of the soils and on the estimated data and test data in the "Soil Properties" section.

Information in this section is intended for land use planning, for evaluating land use alternatives, and for planning site investigations prior to design and construction. The information, however, has limitations. For example, estimates and other data generally apply only to that part of the soil within a depth of 5 or 6 feet. Because of the map scale, small areas of different soils may be included within the mapped areas of a specific soil.

The information is not site specific and does not eliminate the need for onsite investigation of the soils or for testing and analysis by personnel experienced in the design and construction of engineering works.

Government ordinances and regulations that restrict certain land uses or impose specific design criteria were not considered in preparing the information in this section. Local ordinances and regulations should be considered in planning, in site selection, and in design.

Soil properties, site features, and observed performance were considered in

determining the ratings in this section. During the fieldwork for this soil survey, determinations were made about grain-size distribution, liquid limit, plasticity index, soil reaction, depth to bedrock, hardness of bedrock within 5 or 6 feet of the surface, soil wetness, depth to a seasonal high water table, slope, likelihood of flooding, natural soil structure aggregation, and soil density. Data were collected about kinds of clay minerals, mineralogy of the sand and silt fractions, and the kinds of adsorbed cations. Estimates were made for erodibility, permeability, corrosivity, shrink-swell potential, available water capacity, and other behavioral characteristics affecting engineering uses.

This information can be used to evaluate the potential of areas for residential, commercial, industrial, and recreational uses; make preliminary estimates of construction conditions; evaluate alternative routes for roads, streets, highways, pipelines, and underground cables; evaluate alternative sites for sanitary landfills, septic tank absorption fields, and sewage lagoons; plan detailed onsite investigations of soils and geology; locate potential sources of gravel, sand, earthfill, and topsoil; plan drainage systems, irrigation systems, ponds, terraces, and other structures for soil and water conservation; and predict performance of proposed small structures and pavements by comparing the performance of existing similar structures on the same or similar soils.

The information in the tables, along with the soil maps, the soil descriptions, and other data provided in this survey, can be used to make additional interpretations.

Some of the terms used in this soil survey have a special meaning in soil science and are defined in the Glossary.

Building Site Development

Table 9 shows the degree and kind of soil limitations that affect shallow excavations, dwellings with and without basements, small commercial buildings, local roads and streets, and lawns and landscaping. The limitations are considered *slight* if soil properties and site features are generally favorable for the indicated use and limitations are minor and easily overcome; *moderate* if soil properties or site features are not favorable for the indicated use and special planning, design, or maintenance is needed to overcome or minimize the limitations; and *severe* if soil properties or site features are so unfavorable or so difficult to overcome that special design, significant increases in construction costs, and possibly increased maintenance are required. Special feasibility studies may be required where the soil limitations are severe.

Shallow excavations are trenches or holes dug to a maximum depth of 5 or 6 feet for basements, graves, utility lines, open ditches, and other purposes. The ratings are based on soil properties, site features, and observed performance of the soils. The ease of digging, filling, and compacting is affected by the depth to bedrock, a cemented pan, or a very firm dense layer; stone content; soil texture; and slope. The time of the year that excavations can be made is affected by the depth to a seasonal high water table and the susceptibility of the soil to flooding. The resistance of the excavation walls or banks to sloughing or caving is affected by soil texture and depth to the water table.

Dwellings and *small commercial buildings* are structures built on shallow foundations on undisturbed soil. The load limit is the same as that for single-family dwellings no higher than three stories. Ratings are made for small commercial buildings without basements, for dwellings with basements, and for dwellings without basements. The ratings are based on soil properties, site features, and observed performance of the soils. A high water table, flooding, shrinking and swelling, and organic layers can cause the movement of footings. A high water table, depth to bedrock or to a cemented pan, large stones, slope, and flooding affect the ease of

excavation and construction. Landscaping and grading that require cuts and fills of more than 5 or 6 feet are not considered.

Local roads and streets have an all-weather surface and carry automobile and light truck traffic all year. They have a subgrade of cut or fill soil material; a base of gravel, crushed rock, or stabilized soil material; and a flexible or rigid surface. Cuts and fills are generally limited to less than 6 feet. The ratings are based on soil properties, site features, and observed performance of the soils. Depth to bedrock or to a cemented pan, a high water table, flooding, large stones, and slope affect the ease of excavating and grading. Soil strength (as inferred from the engineering classification of the soil), shrink-swell potential, frost-action potential, and depth to a high water table affect the traffic-supporting capacity.

Lawns and landscaping require soils on which turf and ornamental trees and shrubs can be established and maintained. The ratings are based on soil properties, site features, and observed performance of the soils. Soil reaction, a high water table, depth to bedrock or to a cemented pan, the available water capacity in the upper 40 inches, and the content of salts, sodium, and sulfidic materials affect plant growth. Flooding, wetness, slope, stoniness, and the amount of sand, clay, or organic matter in the surface layer affect trafficability after vegetation is established.

Sanitary Facilities

Table 10 shows the degree and kind of soil limitations that affect septic tank absorption fields, sewage lagoons, and sanitary landfills. The limitations are considered *slight* if soil properties and site features are generally favorable for the indicated use and limitations are minor and easily overcome; *moderate* if soil properties or site features are not favorable for the indicated use and special planning, design, or maintenance is needed to overcome or minimize the limitations; and *severe* if soil properties or site features are so unfavorable or so difficult to overcome that special design, significant increases in construction costs, and possibly increased maintenance are required.

Table 10 also shows the suitability of the soils for use as daily cover for landfill. A rating of *good* indicates that soil properties and site features are favorable for the use and good performance and low maintenance can be expected; *fair* indicates that soil properties and site features are moderately favorable for the use and one or more soil properties or site features make the soil less desirable than the soils rated good; and *poor* indicates that one or more soil properties or site features are unfavorable for the use and overcoming the unfavorable properties requires special design, extra maintenance, or costly alteration.

Septic tank absorption fields are areas in which effluent from a septic tank is distributed into the soil through subsurface tiles or perforated pipe. Only that part of the soil between depths of 24 and 72 inches is evaluated. The ratings are based on soil properties, site features, and observed performance of the soils. Permeability, a high water table, depth to bedrock or to a cemented pan, and flooding affect absorption of the effluent. Large stones and bedrock or a cemented pan interfere with installation.

Unsatisfactory performance of septic tank absorption fields, including excessively slow absorption of effluent, surfacing of effluent, and hillside seepage, can affect public health. Ground water can be polluted if highly permeable sand and gravel or fractured bedrock is less than 4 feet below the base of the absorption field, if slope is excessive, or if the water table is near the surface. There must be unsaturated soil material beneath the absorption field to filter the effluent effectively. Many local ordinances require that this material be of a certain thickness.

Sewage lagoons are shallow ponds constructed to hold sewage while aerobic bacteria decompose the solid and liquid wastes. Lagoons should have a nearly level floor surrounded by cut slopes or embankments of compacted soil. Lagoons generally

are designed to hold the sewage within a depth of 2 to 5 feet. Nearly impervious soil material for the lagoon floor and sides is required to minimize seepage and contamination of ground water.

Table 10 gives ratings for the natural soil that makes up the lagoon floor. The surface layer and, generally, 1 or 2 feet of soil material below the surface layer are excavated to provide material for the embankments. The ratings are based on soil properties, site features, and observed performance of the soils. Considered in the ratings are slope, permeability, a high water table, depth to bedrock or to a cemented pan, flooding, large stones, and content of organic matter.

Excessive seepage resulting from rapid permeability in the soil or a water table that is high enough to raise the level of sewage in the lagoon causes a lagoon to function unsatisfactorily. Pollution results if seepage is excessive or if floodwater overtops the lagoon. A high content of organic matter is detrimental to proper functioning of the lagoon because it inhibits aerobic activity. Slope, bedrock, and cemented pans can cause construction problems, and large stones can hinder compaction of the lagoon floor.

Sanitary landfills are areas where solid waste is disposed of by burying it in soil. There are two types of landfill—trench and area. In a trench landfill, the waste is placed in a trench. It is spread, compacted, and covered daily with a thin layer of soil excavated at the site. In an area landfill, the waste is placed in successive layers on the surface of the soil. The waste is spread, compacted, and covered daily with a thin layer of soil from a source away from the site.

Both types of landfill must be able to bear heavy vehicular traffic. Both types involve a risk of ground-water pollution. Ease of excavation and revegetation should be considered.

The ratings in table 10 are based on soil properties, site features, and observed performance of the soils. Permeability, depth to bedrock or to a cemented pan, a high water table, slope, and flooding affect both types of landfill. Texture, stones and boulders, highly organic layers, soil reaction, and content of salts and sodium affect trench landfills. Unless otherwise stated, the ratings apply only to that part of the soil within a depth of about 6 feet. For deeper trenches, a limitation rated slight or moderate may not be valid. Onsite investigation is needed.

Daily cover for landfill is the soil material that is used to cover compacted solid waste in an area sanitary landfill. The soil material is obtained offsite, transported to the landfill, and spread over the waste.

Soil texture, wetness, coarse fragments, and slope affect the ease of removing and spreading the material during wet and dry periods. Loamy or silty soils that are free of large stones or excess gravel are the best cover for a landfill. Clayey soils are sticky or cloddy and are difficult to spread; sandy soils are subject to wind erosion.

After soil material has been removed, the soil material remaining in the borrow area must be thick enough over bedrock, a cemented pan, or the water table to permit revegetation. The soil material used as the final cover for a landfill should be suitable for plants. The surface layer generally has the best workability, more organic matter, and the best potential for plants. Material from the surface layer should be stockpiled for use as the final cover.

Construction Materials

Table 11 gives information about the soils as a source of roadfill, sand, gravel, and topsoil. The soils are rated *good*, *fair*, or *poor* as a source of roadfill and topsoil. They are rated as a *probable* or *improbable* source of sand and gravel. The ratings are based on soil properties and site features that affect the removal of the soil and its use as construction material. Normal compaction, minor processing, and other standard construction practices are assumed. Each soil is evaluated to a depth of 5 or 6 feet.

Roadfill is soil material that is excavated in one place and used in road embankments in another place. In this table, the soils are rated as a source of roadfill for low embankments, generally less than 6 feet high and less exacting in design than higher embankments.

The ratings are for the soil material below the surface layer to a depth of 5 or 6 feet. It is assumed that soil layers will be mixed during excavating and spreading. Many soils have layers of contrasting suitability within their profile. The table showing engineering index properties provides detailed information about each soil layer. This information can help to determine the suitability of each layer for use as roadfill. The performance of soil after it is stabilized with lime or cement is not considered in the ratings.

The ratings are based on soil properties, site features, and observed performance of the soils. The thickness of suitable material is a major consideration. Large stones, a high water table, and slope affect the ease of excavation. How well the soil performs in place after it has been compacted and drained is determined by its strength (as inferred from the engineering classification of the soil) and shrink-swell potential.

Soils rated *good* contain significant amounts of sand or gravel or both. They have at least 5 feet of suitable material, a low shrink-swell potential, few cobbles and stones, and slopes of 15 percent or less. Depth to the water table is more than 3 feet. Soils rated *fair* are more than 35 percent silt- and clay-sized particles and have a plasticity index of less than 10. They have a moderate shrink-swell potential, slopes of 15 to 25 percent, or many stones. Depth to the water table is 1 to 3 feet. Soils rated *poor* have a plasticity index of more than 10, a high shrink-swell potential, many stones, or slopes of more than 25 percent; or they are wet and have a water table at a depth of less than 1 foot. They may have layers of suitable material, but the material is less than 3 feet thick.

Sand and *gravel* are natural aggregates suitable for commercial use with a minimum of processing. They are used in many kinds of construction. Specifications for each use vary widely. In table 11, only the probability of finding material in suitable quantity is evaluated. The suitability of the material for specific purposes is not evaluated, nor are factors that affect excavation of the material.

The properties used to evaluate the soil as a source of sand or gravel are gradation of grain sizes (as indicated by the engineering classification of the soil), the thickness of suitable material, and the content of rock fragments. Kinds of rock, acidity, and stratification are given in the soil series descriptions. Gradation of grain sizes is given in the table on engineering index properties.

A soil rated as a probable source has a layer of clean sand or gravel or a layer of sand or gravel that is up to 12 percent silty fines. This material must be at least 3 feet thick and less than 50 percent, by weight, large stones. All other soils are rated as an improbable source. Coarse fragments of soft bedrock, such as shale and siltstone, are not considered to be sand and gravel.

Topsoil is used to cover an area so that vegetation can be established and maintained. The upper 40 inches of a soil is evaluated for use as topsoil. Also evaluated is the reclamation potential of the borrow area.

Plant growth is affected by toxic material and by such properties as soil reaction, available water capacity, and fertility. Rock fragments affect the ease of excavating, loading, and spreading, slope, a water table, soil texture, and thickness of suitable material. Reclamation of the borrow area is affected by slope, a water table, rock fragments, bedrock, and toxic material.

Soils rated *good* have friable, loamy material to a depth of at least 40 inches. They are free of stones and cobbles, have little or no gravel, and have slopes of less than 8 percent. They are low in content of soluble salts, are naturally fertile or respond well to fertilizer, and are not so wet that excavation is difficult.

Soils rated *fair* are sandy soils, loamy soils that have a relatively high content of

clay, soils that have only 20 to 40 inches of suitable material, soils that have an appreciable amount of gravel, stones, or soluble salts, or soils that have slopes of 8 to 15 percent. The soils are not so wet that excavation is difficult.

Soils rated *poor* are very sandy or clayey, have less than 20 inches of suitable material, have a large amount of gravel, stones, or soluble salts, have slopes of more than 15 percent, or have a seasonal high water table at or near the surface.

The surface layer of most soils is generally preferred for topsoil because of its organic matter content. Organic matter greatly increases the absorption and retention of moisture and nutrients for plant growth.

Water Management

Table 12 gives information on the soil properties and site features that affect water management. The degree and kind of soil limitations are given for pond reservoir areas; embankments, dikes, and levees; and aquifer-fed excavated ponds. The limitations are considered *slight* if soil properties and site features are generally favorable for the indicated use and limitations are minor and are easily overcome; *moderate* if soil properties or site features are not favorable for the indicated use and special planning, design, or maintenance is needed to overcome or minimize the limitations; and *severe* if soil properties or site features are so unfavorable or so difficult to overcome that special design, significant increase in construction costs, and possibly increased maintenance are required.

This table also gives for each soil the restrictive features that affect drainage, irrigation, terraces and diversions, and grassed waterways.

Pond reservoir areas hold water behind a dam or embankment. Soils best suited to this use have low seepage potential in the upper 60 inches. The seepage potential is determined by the permeability of the soil and the depth to fractured bedrock or other permeable material. The underlying material is not rated and should be evaluated during an onsite investigation. Excessive slope can affect the storage capacity of the reservoir area.

Embankments, dikes, and levees are raised structures of soil material, generally less than 20 feet high, constructed to impound water or to protect land against overflow. In this table, the soils are rated as a source of material for embankment fill. The ratings apply to the soil material below the surface layer to a depth of about 5 feet. It is assumed that soil layers will be uniformly mixed and compacted during construction.

The ratings do not indicate the ability of the natural soil to support an embankment. Soil properties to a depth even greater than the height of the embankment can affect performance and safety of the embankment. Generally, deeper onsite investigation is needed to determine these properties.

Soil material in embankments must be resistant to seepage, piping, and erosion and have favorable compaction characteristics. Unfavorable features include less than 5 feet of suitable material and a high content of stones or boulders, organic matter, or salts or sodium. A high water table affects the amount of usable material. It also affects trafficability.

Aquifer-fed excavated ponds are pits or dugouts that extend to a ground-water aquifer or to a depth below a permanent water table. Excluded are ponds that are fed only by surface runoff and embankment ponds that impound water 3 feet or more above the original surface. Excavated ponds are affected by depth to a permanent water table, permeability of the aquifer, and quality of the water as inferred from the salinity of the soil. Depth to bedrock and the content of large stones affect the ease of excavation.

Drainage is the removal of excess surface and subsurface water from the soil. How easily and effectively the soil is drained depends on the depth to bedrock, to a

cemented pan, or to other layers that affect the rate of water movement; permeability; depth to a high water table or depth of standing water if the soil is subject to ponding; slope; susceptibility to flooding; subsidence of organic layers; and the potential for frost action. Excavating and grading and the stability of ditchbanks are affected by depth to bedrock or to a cemented pan, large stones, slope, and the hazard of cutbanks caving. The productivity of the soil after drainage is adversely affected by extreme acidity or by toxic substances in the root zone, such as salts, sodium, and sulfur. Availability of drainage outlets is not considered in the ratings.

Irrigation is the controlled application of water to supplement rainfall and support plant growth. The design and management of an irrigation system are affected by depth to the water table, the need for drainage, flooding, available water capacity, intake rate, permeability, erosion hazard, and slope. The construction of a system is affected by large stones and depth to bedrock or to a cemented pan. The performance of a system is affected by the depth of the root zone, the amount of salts or sodium, and soil reaction.

Terraces and diversions are embankments or a combination of channels and ridges constructed across a slope to control erosion and conserve moisture by intercepting runoff. Slope, wetness, large stones, and depth to bedrock or to a cemented pan affect the construction of terraces and diversions. A restricted rooting depth, a severe hazard of wind erosion or water erosion, an excessively coarse texture, and restricted permeability adversely affect maintenance.

Grassed waterways are natural or constructed channels, generally broad and shallow, that conduct surface water to outlets at a nonerosive velocity. Large stones, wetness, slope, and depth to bedrock or to a cemented pan affect the construction of grassed waterways. A hazard of wind erosion, low available water capacity, restricted rooting depth, toxic substances such as salts and sodium, and restricted permeability adversely affect the growth and maintenance of the grass after construction.

Soil Properties

Data relating to soil properties are collected during the course of the soil survey. The data and the estimates of soil and water features, listed in tables, are explained on the following pages.

Soil properties are determined by field examination of the soils and by laboratory index testing of some benchmark soils. Established standard procedures are followed. During the survey, many shallow borings are made and examined to identify and classify the soils and to delineate them on the soil maps. Samples are taken from some typical profiles and tested in the laboratory to determine grain-size distribution, plasticity, and compaction characteristics.

Estimates of soil properties are based on field examinations, on laboratory tests of samples from the survey area, and on laboratory tests of samples of similar soils in nearby areas. Tests verify field observations, verify properties that cannot be estimated accurately by field observation, and help to characterize key soils.

The estimates of soil properties shown in the tables include the range of grain-size distribution and Atterberg limits, the engineering classification, and the physical and chemical properties of the major layers of each soil. Pertinent soil and water features also are given.

Engineering Index Properties

Table 13 gives estimates of the engineering classification and of the range of index properties for the major layers of each soil in the survey area. Most soils have layers of contrasting properties within the upper 5 or 6 feet.

Depth to the upper and lower boundaries of each layer is indicated. The range in depth and information on other properties of each layer are given for each soil series under the heading "Soil Series and Their Morphology."

Texture is given in the standard terms used by the U.S. Department of Agriculture (14). These terms are defined according to percentages of sand, silt, and clay in the fraction of the soil that is less than 2 millimeters in diameter. "Loam," for example, is soil that is 7 to 27 percent clay, 28 to 50 percent silt, and less than 52 percent sand. If the content of particles coarser than sand is as much as about 15 percent, an appropriate modifier is added, for example, "gravelly." Textural terms are defined in the Glossary.

Classification of the soils is determined according to the Unified soil classification system (2) and the system adopted by the American Association of State Highway and Transportation Officials (1).

The Unified system classifies soils according to properties that affect their use as construction material. Soils are classified according to grain-size distribution of the fraction less than 3 inches in diameter and according to plasticity index, liquid limit, and organic matter content. Sandy and gravelly soils are identified as GW, GP, GM, GC, SW, SP, SM, and SC; silty and clayey soils as ML, CL, OL, MH, CH, and OH; and highly organic soils as PT. Soils exhibiting engineering properties of two groups can have a dual classification, for example, CL-ML.

The AASHTO system classifies soils according to those properties that affect roadway construction and maintenance. In this system, the fraction of a mineral soil

that is less than 3 inches in diameter is classified in one of seven groups from A-1 through A-7 on the basis of grain-size distribution, liquid limit, and plasticity index. Soils in group A-1 are coarse grained and low in content of fines (silt and clay). At the other extreme, soils in group A-7 are fine grained. Highly organic soils are classified in group A-8 on the basis of visual inspection.

If laboratory data are available, the A-1, A-2, and A-7 groups are further classified as A-1-a, A-1-b, A-2-4, A-2-5, A-2-6, A-2-7, A-7-5, or A-7-6. As an additional refinement, the suitability of a soil as subgrade material can be indicated by a group index number. Group index numbers range from 0 for the best subgrade material to 20 or higher for the poorest.

Rock fragments larger than 10 inches in diameter and 3 to 10 inches in diameter are indicated as a percentage of the total soil on a dry-weight basis. The percentages are estimates determined mainly by converting volume percentage in the field to weight percentage.

Percentage (of soil particles) passing designated sieves is the percentage of the soil fraction less than 3 inches in diameter based on an oven-dry weight. The sieves, numbers 4, 10, 40, and 200 (USA Standard Series), have openings of 4.76, 2.00, 0.420, and 0.074 millimeters, respectively. Estimates are based on laboratory tests of soils sampled in the survey area and in nearby areas and on estimates made in the field.

Liquid limit and plasticity index (Atterberg limits) indicate the plasticity characteristics of a soil. The estimates are based on test data from the survey area or from nearby areas and on field examination.

Physical Properties

Table 14 shows estimates of some physical characteristics and features that affect soil behavior. These estimates are given for the layers of each soil in the survey area. The estimates are based on field observations and on test data for these and similar soils.

Depth to the upper and lower boundaries of each layer is indicated. Particle size is the effective diameter of a soil particle as measured by sedimentation, sieving, or micrometric methods. Particle sizes are expressed as classes with specific effective diameter class limits. The broad classes are sand, silt, and clay, ranging from the larger to the smaller.

The content of sand, silt, and clay affects the physical behavior of a soil. Particle size is important for engineering and agronomic interpretations, for determination of soil hydrologic qualities, and for soil classification.

The amount and kind of clay affect the fertility and physical condition of the soil and the ability of the soil to adsorb cations and to retain moisture. They influence shrink-swell potential, permeability, plasticity, the ease of soil dispersion, and other soil properties. The amount and kind of clay in a soil also affect tillage and earthmoving operations.

Clay as a soil separate consists of mineral soil particles that are less than 0.002 millimeter in diameter. In this table, the estimated clay content of each soil layer is given as a percentage, by weight, of the soil material that is less than 2 millimeters in diameter.

Moist bulk density is the weight of soil (oven-dry) per unit volume. Volume is measured when the soil is at field moisture capacity, that is, the moisture content at $\frac{1}{3}$ -bar or $\frac{1}{10}$ -bar (33kPa or 10kPa) moisture tension. Weight is determined after the soil is dried at 105 degrees C. In this table, the estimated moist bulk density of each soil horizon is expressed in grams per cubic centimeter of soil material that is less than 2 millimeters in diameter. Bulk density data are used to compute shrink-swell potential, available water capacity, total pore space, and other soil properties. The

moist bulk density of a soil indicates the pore space available for water and roots. Depending on soil texture, a bulk density of more than 1.4 can restrict water storage and root penetration. Moist bulk density is influenced by texture, kind of clay, content of organic matter, and soil structure.

Permeability refers to the ability of a soil to transmit water or air. The term “permeability,” as used in soil surveys, indicates saturated hydraulic conductivity (K_{sat}). The estimates in the table indicate the rate of water movement, in inches per hour, when the soil is saturated. They are based on soil characteristics observed in the field, particularly structure, porosity, and texture. Permeability is considered in the design of soil drainage systems and septic tank absorption fields.

Available water capacity refers to the quantity of water that the soil is capable of storing for use by plants. The capacity for water storage is given in inches of water per inch of soil for each soil layer. The capacity varies, depending on soil properties that affect retention of water. The most important properties are the content of organic matter, soil texture, bulk density, and soil structure. Available water capacity is an important factor in the choice of plants or crops to be grown and in the design and management of irrigation systems. Available water capacity is not an estimate of the quantity of water actually available to plants at any given time.

Linear extensibility refers to the change in length of an unconfined clod as moisture content is decreased from a moist to a dry state. It is an expression of the volume change between the water content of the clod at $1/3$ - or $1/10$ -bar tension (33kPa or 10kPa tension) and oven dryness. The volume change is reported in the table as percent change for the whole soil. Volume change is influenced by the amount and type of clay minerals in the soil. Linear extensibility is used to determine the shrink-swell potential of soils. The shrink-swell potential is low if the soil has a linear extensibility of less than 3 percent; moderate if 3 to 6 percent; high if 6 to 9 percent; and very high if more than 9 percent. If the linear extensibility is more than 3, shrinking and swelling can cause damage to buildings, roads, and other structures and to plant roots. Special design commonly is needed.

Organic matter is the plant and animal residue in the soil at various stages of decomposition. In this table, the estimated content of organic matter is expressed as a percentage, by weight, of the soil material that is less than 2 millimeters in diameter. The content of organic matter in a soil can be maintained by returning crop residue to the soil. Organic matter has a positive effect on available water capacity, water infiltration, soil organism activity, and tilth. It is a source of nitrogen and other nutrients for crops and soil organisms.

Erosion factors are shown in this table as the K factor (K_w and K_f) and the T factor. Erosion factor K indicates the susceptibility of a soil to sheet and rill erosion by water. Factor K is one of several factors used in the Universal Soil Loss Equation (USLE) and the Revised Universal Soil Loss Equation (RUSLE) to predict the average annual rate of soil loss by sheet and rill erosion in tons per acre per year. The estimates are based primarily on percentage of silt, sand, and organic matter and on soil structure and permeability. Values of K range from 0.02 to 0.69. Other factors being equal, the higher the value, the more susceptible the soil is to sheet and rill erosion by water.

Erosion factor K_w indicates the erodibility of the whole soil. The estimates are modified by the presence of rock fragments.

Erosion factor K_f indicates the erodibility of the fine-earth fraction, or the material less than 2 millimeters in size.

Erosion factor T is an estimate of the maximum average annual rate of soil erosion by wind or water that can occur without affecting crop productivity over a sustained period. The rate is in tons per acre per year.

Wind erodibility groups are made up of soils that have similar properties affecting their susceptibility to wind erosion in cultivated areas. The soils assigned to group 1

are the most susceptible to wind erosion, and those assigned to group 8 are the least susceptible. The groups are as follows:

1. Coarse sands, sands, fine sands, and very fine sands.
2. Loamy coarse sands, loamy sands, loamy fine sands, loamy very fine sands, ash material, and sapric soil material.
3. Coarse sandy loams, sandy loams, fine sandy loams, and very fine sandy loams.
- 4L. Calcareous loams, silt loams, clay loams, and silty clay loams.
4. Clays, silty clays, noncalcareous clay loams, and silty clay loams that are more than 35 percent clay.
5. Noncalcareous loams and silt loams that are less than 20 percent clay and sandy clay loams, sandy clays, and hemic soil material.
6. Noncalcareous loams and silt loams that are more than 20 percent clay and noncalcareous clay loams that are less than 35 percent clay.
7. Silts, noncalcareous silty clay loams that are less than 35 percent clay, and fibric soil material.
8. Soils that are not subject to wind erosion because of coarse fragments on the surface or because of surface wetness.

Wind erodibility index is a numerical value indicating the susceptibility of soil to wind erosion, or the tons per acre per year that can be expected to be lost to wind erosion. A close correlation exists between wind erosion and the texture of the surface layer, the size and durability of surface clods, rock fragments, organic matter, and a calcareous reaction. Soil moisture and frozen soil layers also influence wind erosion.

Chemical Properties

Table 15 shows estimates of some chemical characteristics and features that affect soil behavior. These estimates are given for the layers of each soil in the survey area. The estimates are based on field observations and on test data for these and similar soils.

Depth to the upper and lower boundaries of each layer is indicated.

Cation-exchange capacity is the total amount of extractable bases that can be held by the soil, expressed in terms of milliequivalents per 100 grams of soil at neutrality (pH 7.0) or at some other stated pH value. Soils having a low cation-exchange capacity hold fewer cations and may require more frequent applications of fertilizer than soils having a high cation-exchange capacity. The ability to retain cations reduces the hazard of ground-water pollution.

Effective cation-exchange capacity refers to the sum of extractable bases plus aluminum expressed in terms of milliequivalents per 100 grams of soil. It is determined for soils that have a pH of less than 5.5.

Soil reaction is a measure of acidity or alkalinity. The pH of each soil horizon is based on many field tests. For many soils, values have been verified by laboratory analyses. Soil reaction is important in selecting crops and other plants, in evaluating soil amendments for fertility and stabilization, and in determining the risk of corrosion.

Calcium carbonate equivalent is the percent of carbonates, by weight, in the fraction of the soil less than 2 millimeters in size. The availability of plant nutrients is influenced by the amount of carbonates in the soil. Incorporating nitrogen fertilizer into calcareous soils helps to prevent nitrite accumulation and ammonium-N volatilization.

Gypsum is expressed as a percent, by weight, of hydrated calcium sulfates in the fraction of the soil less than 20 millimeters in size. Gypsum is partially soluble in water. Soils that have a high content of gypsum may collapse if the gypsum is removed by percolating water.

Salinity is a measure of soluble salts in the soil at saturation. It is expressed as the electrical conductivity of the saturation extract, in millimhos per centimeter at 25

degrees C. Estimates are based on field and laboratory measurements at representative sites of nonirrigated soils. The salinity of irrigated soils is affected by the quality of the irrigation water and by the frequency of water application. Hence, the salinity of soils in individual fields can differ greatly from the value given in the table. Salinity affects the suitability of a soil for crop production, the stability of soil if used as construction material, and the potential of the soil to corrode metal and concrete.

Sodium adsorption ratio (SAR) is a measure of the amount of sodium (Na) relative to calcium (Ca) and magnesium (Mg) in the water extract from saturated soil paste. It is the ratio of the Na concentration divided by the square root of one-half of the Ca + Mg concentration. Soils that have SAR values of 13 or more may be characterized by an increased dispersion of organic matter and clay particles, reduced permeability and aeration, and a general degradation of soil structure.

Soil Features

Table 16 gives estimates of soil features affecting the risk of corrosion. The estimates are used in land use planning that involves engineering considerations.

Risk of corrosion pertains to potential soil-induced electrochemical or chemical action that corrodes or weakens uncoated steel or concrete. The rate of corrosion of uncoated steel is related to such factors as soil moisture, particle-size distribution, acidity, and electrical conductivity of the soil. The rate of corrosion of concrete is based mainly on the sulfate and sodium content, texture, moisture content, and acidity of the soil. Special site examination and design may be needed if the combination of factors results in a severe hazard of corrosion. The steel or concrete in installations that intersect soil boundaries or soil layers is more susceptible to corrosion than the steel or concrete in installations that are entirely within one kind of soil or within one soil layer.

For uncoated steel, the risk of corrosion, expressed as *low*, *moderate*, or *high*, is based on soil drainage class, total acidity, electrical resistivity near field capacity, and electrical conductivity of the saturation extract. For concrete, the risk of corrosion also is expressed as *low*, *moderate*, or *high*. It is based on soil texture, acidity, and amount of sulfates in the saturation extract.

Water Features

Table 17 gives estimates of various water features. The estimates are used in land use planning that involves engineering considerations.

Hydrologic groups are based on estimates of runoff potential. Soils are assigned to one of four groups according to the rate of water infiltration when the soils are not protected by vegetation, are thoroughly wet, and receive precipitation from long-duration storms.

The four hydrologic soil groups are:

Group A. Soils having a high infiltration rate (low runoff potential) when thoroughly wet. These consist mainly of deep, well drained to excessively drained sands or gravelly sands. These soils have a high rate of water transmission.

Group B. Soils having a moderate infiltration rate when thoroughly wet. These consist chiefly of moderately deep or deep, moderately well drained or well drained soils that have moderately fine texture to moderately coarse texture. These soils have a moderate rate of water transmission.

Group C. Soils having a slow infiltration rate when thoroughly wet. These consist chiefly of soils having a layer that impedes the downward movement of water or soils of moderately fine texture or fine texture. These soils have a slow rate of water transmission.

Group D. Soils having a very slow infiltration rate (high runoff potential) when

thoroughly wet. These consist chiefly of clays that have a high shrink-swell potential, soils that have a high water table, soils that have a claypan or clay layer at or near the surface, and soils that are shallow over nearly impervious material. These soils have a very slow rate of water transmission. If a soil is assigned to a dual hydrologic group (A/D, B/D, or C/D), the first letter is for drained areas and the second is for undrained areas.

The *months* in the table indicate the time of year in which the feature is most likely to be a concern.

Water table refers to a saturated zone in the soil. Table 17 indicates, by month, depth to the top (*upper limit*) and base (*lower limit*) of the saturated zone in most years. Estimates of the upper and lower limits are based mainly on observations of the water table at selected sites and on evidence of a saturated zone, namely grayish colors or mottles (redoximorphic features) in the soil. A saturated zone that lasts for less than a month is not considered a water table.

Ponding is standing water in a closed depression. Unless a drainage system is installed, the water is removed only by percolation, transpiration, or evaporation. Table 17 indicates surface water depth and the duration and frequency of ponding. Duration is expressed as *very brief* if less than 2 days, *brief* if 2 to 7 days, *long* if 7 to 30 days, and *very long* if more than 30 days. Frequency is expressed as *none*, *rare*, *occasional*, and *frequent*. *None* means that ponding is not probable; *rare* that it is unlikely but possible under unusual weather conditions (the chance of ponding is nearly 0 percent to 5 percent in any year); *occasional* that it occurs, on the average, once or less in 2 years (the chance of ponding is 5 to 50 percent in any year); and *frequent* that it occurs, on the average, more than once in 2 years (the chance of ponding is more than 50 percent in any year).

Flooding is the temporary inundation of an area caused by overflowing streams, by runoff from adjacent slopes, or by tides. Water standing for short periods after rainfall or snowmelt is not considered flooding, and water standing in swamps and marshes is considered ponding rather than flooding. Duration and frequency are estimated.

Duration is expressed as *extremely brief* if 0.1 hour to 4 hours, *very brief* if 4 hours to 2 days, *brief* if 2 to 7 days, *long* if 7 to 30 days, and *very long* if more than 30 days.

Frequency is expressed as *none*, *very rare*, *rare*, *occasional*, *frequent*, and *very frequent*. *None* means that flooding is not probable; *very rare* that it is very unlikely but possible under extremely unusual weather conditions (the chance of flooding is less than 1 percent in any year); *rare* that it is unlikely but possible under unusual weather conditions (the chance of flooding is 1 to 5 percent in any year); *occasional* that it occurs infrequently under normal weather conditions (the chance of flooding is 5 to 50 percent in any year); *frequent* that it is likely to occur often under normal weather conditions (the chance of flooding is more than 50 percent in any year but is less than 50 percent in all months in any year); and *very frequent* that it is likely to occur very often under normal weather conditions (the chance of flooding is more than 50 percent in all months of any year).

The information is based on evidence in the soil profile, namely thin strata of gravel, sand, silt, or clay deposited by floodwater; irregular decrease in organic matter content with increasing depth; and little or no horizon development.

Also considered are local information about the extent and levels of flooding and the relation of each soil on the landscape to historic floods. Information on the extent of flooding based on soil data is less specific than that provided by detailed engineering surveys that delineate flood-prone areas at specific flood frequency levels.

Physical and Chemical Analyses of Selected Soils

The results of physical analyses for several typical pedons in the survey area are given in table 18 and the results of chemical analyses in table 19. The data are for

soils sampled at carefully selected sites. Unless otherwise indicated, the pedons are typical of the series. They are described in the section "Soil Series and Their Morphology." Soil samples were analyzed by the Soil Characterization Laboratory, Texas Agricultural Experiment Station, College Station, Texas.

Most determinations, except those for grain-size analysis and bulk density, were made on soil material smaller than 2 millimeters in diameter. Measurements reported as percent or quantity of unit weight were calculated on an oven-dry basis. The methods used in obtaining the data are indicated in the list that follows. The codes in parentheses refer to published methods (18).

Sand—(0.05-2.0 mm fraction) weight percentages of material less than 2 mm (3A1).

Silt—(0.002-0.05 mm fraction) pipette extraction, weight percentages of all material less than 2 mm (3A1).

Clay—(fraction less than 0.002 mm) pipette extraction, weight percentages of material less than 2 mm (3A1).

Water retained—pressure extraction, percentage of oven-dry weight of less than 2 mm material; $\frac{1}{3}$ or $\frac{1}{10}$ bar (4B1), 15 bars (4B2).

Bulk density—of less than 2 mm material, saran-coated clods field moist (4A1a), $\frac{1}{3}$ bar (4A1d), oven-dry (4A1h).

Linear extensibility—change in clod dimension based on whole soil (4D).

Organic carbon—wet combustion. Walkley-Black modified acid-dichromate, ferric sulfate titration (6A1c).

Extractable cations—ammonium acetate pH 7.0, atomic absorption; calcium (6N2e), magnesium (6O2d), sodium (6P2b), potassium (6Q2b).

Cation-exchange capacity—ammonium acetate, pH 7.0, steam distillation (5A8b).

Base saturation—ammonium acetate, pH 7.0 (5C1).

Reaction (pH)—1:1 water dilution (8C1f).

Electrical conductivity—saturation extract (8A3a).

Sodium adsorption ratio (5E).

Classification of the Soils

The system of soil classification used by the National Cooperative Soil Survey has six categories (20). Beginning with the broadest, these categories are the order, suborder, great group, subgroup, family, and series. Classification is based on soil properties observed in the field or inferred from those observations or from laboratory measurements. Table 20 shows the classification of the soils in the survey area. The categories are defined in the following paragraphs.

ORDER. Twelve soil orders are recognized. The differences among orders reflect the dominant soil-forming processes and the degree of soil formation. Each order is identified by a word ending in *sol*. An example is Ultisol.

SUBORDER. Each order is divided into suborders primarily on the basis of properties that influence soil genesis and are important to plant growth or properties that reflect the most important variables within the orders. The last syllable in the name of a suborder indicates the order. An example is Ustult (*Ust*, meaning dry or burnt, plus *ult*, from Ultisol).

GREAT GROUP. Each suborder is divided into great groups on the basis of close similarities in kind, arrangement, and degree of development of pedogenic horizons; soil moisture and temperature regimes; type of saturation; and base status. Each great group is identified by the name of a suborder and by a prefix that indicates a property of the soil. An example is Haplustults (*Hapl*, meaning minimal horization, plus *ustult*, the suborder of the Ultisols that has a ustic moisture regime).

SUBGROUP. Each great group has a typic subgroup. Other subgroups are intergrades or extragrades. The typic subgroup is the central concept of the great group; it is not necessarily the most extensive. Intergrades are transitions to other orders, suborders, or great groups. Extragrades have some properties that are not representative of the great group but do not indicate transitions to any other taxonomic class. Each subgroup is identified by one or more adjectives preceding the name of the great group. The adjective *Typic* identifies the subgroup that typifies the great group. An example is Typic Haplustults.

FAMILY. Families are established within a subgroup on the basis of physical and chemical properties and other characteristics that affect management. Generally, the properties are those of horizons below plow depth where there is much biological activity. Among the properties and characteristics considered are particle size, mineral content, soil temperature regime, soil depth, and reaction. A family name consists of the name of a subgroup preceded by terms that indicate soil properties. An example is fine, mixed, semiactive, thermic Typic Haplustults.

SERIES. The series consists of soils within a family that have horizons similar in color, texture, structure, reaction, consistence, mineral and chemical composition, and arrangement in the profile.

Soil Series and Their Morphology

In this section, each soil series recognized in the survey area is described. Characteristics of the soil and the material in which it formed are identified for each series. A pedon, a small three-dimensional area of soil that is typical of the series in the survey area is described. The detailed description of each soil horizon follows

standards in the “Soil Survey Manual” (19). Many of the technical terms used in the descriptions are defined in “Soil Taxonomy” (20). Unless otherwise indicated, colors in the descriptions are for dry soil. Following the pedon description is the range of important characteristics of the soils in the series.

The map units of each soil series are described in the section “Detailed Soil Map Units.”

Arenosa Series

The Arenosa series consists of very deep, very gently sloping to moderately sloping, somewhat excessively drained, rapidly permeable soils on uplands. These soils formed in thick beds of sand. Slopes range from 1 to 8 percent. The soils are classified as thermic, uncoated Ustic Quartzipsamments.

Typical pedon of Arenosa fine sand, 1 to 8 percent slopes; from the intersection of U.S. Highway 79 and Farm Road 1940 in New Baden, 6.5 miles east on U.S. Highway 79, about 5.4 miles southeast on County Road 355, about 0.5 mile southwest on a private road along an electric transmission line right-of-way, 1,900 feet north on the private road, 50 feet west, in wooded rangeland:

- A—0 to 8 inches; pale brown (10YR 6/3) fine sand, brown (10YR 4/3) moist; single grain; loose; common medium and many fine roots; very strongly acid; clear smooth boundary.
- C1—8 to 43 inches; pale brown (10YR 6/3) fine sand, brown (10YR 5/3) moist; single grain; loose; common medium and many fine roots; very strongly acid; gradual smooth boundary.
- C2—43 to 65 inches; very pale brown (10YR 7/3) fine sand, pale brown (10YR 6/3) moist; single grain; loose; common fine roots; very strongly acid; gradual smooth boundary.
- C3—65 to 80 inches; very pale brown (10YR 8/3) fine sand, very pale brown (10YR 7/3) moist; few fine distinct strong brown (7.5YR 5/8) coatings on sand grains; single grain; loose; few fine roots; very strongly acid.

The sand is more than 80 inches thick. The profile is fine sand or sand throughout and is less than 5 percent silt plus clay.

The A horizon is brown, pale brown, or light yellowish brown. Reaction ranges from very strongly acid to slightly acid.

The C horizon is pale brown or very pale brown. In some pedons this horizon has strong brown or brownish yellow coatings on sand grains in the lower part. Reaction ranges from very strongly acid to moderately acid.

Bastrop Series

The Bastrop series consists of very deep, very gently sloping, well drained, moderately permeable soils on stream terraces of the Brazos River. These soils formed in loamy alluvial sediments. Slopes range from 1 to 3 percent. The soils are classified as fine-loamy, mixed, active, thermic Udic Paleustalfs.

Typical pedon of Bastrop fine sandy loam, 1 to 3 percent slopes; from the intersection of Farm Road 1644 and Texas Highway 6 in Calvert, 1.0 mile west on Farm Road 1644, about 2.25 miles west on County Road 112, about 0.85 mile northwest on a ranch road, 900 feet southwest in improved pasture:

- Ap—0 to 7 inches; light brown (7.5YR 6/4) fine sandy loam, brown (7.5YR 4/4) moist; weak medium subangular blocky structure; slightly hard, very friable; many fine

and common medium roots; many very fine pores; moderately acid; clear smooth boundary.

A—7 to 13 inches; brown (7.5YR 5/4) fine sandy loam, brown (7.5YR 4/4) moist; weak medium subangular blocky structure; slightly hard, very friable; common fine and medium roots; many very fine pores; moderately acid; abrupt smooth boundary.

Bt1—13 to 35 inches; red (2.5YR 5/6) sandy clay loam, red (2.5YR 4/6) moist; moderate medium subangular blocky structure; hard, firm; common fine and few medium roots; common fine and medium pores; few distinct clay films on faces of peds; moderately acid; gradual smooth boundary.

Bt2—35 to 52 inches; red (2.5YR 5/8) sandy clay loam, red (2.5YR 4/8) moist; moderate medium angular blocky structure; hard, firm; few fine roots; common fine pores; common distinct clay films on faces of peds; slightly acid; gradual smooth boundary.

Bt3—52 to 70 inches; light red (2.5YR 6/8) sandy clay loam, red (2.5YR 4/8) moist; moderate medium angular blocky structure; very hard, firm; few fine roots; few fine pores; common distinct clay films on faces of peds; slightly acid; clear smooth boundary.

Bt4—70 to 80 inches; reddish yellow (5YR 6/8) sandy clay loam, yellowish red (5YR 5/8) moist; moderate medium subangular blocky structure; hard, friable; few fine roots; common distinct clay films on faces of peds; slightly acid.

The solum is 60 to more than 80 inches thick. Rounded siliceous pebbles range from none to about 3 percent throughout the profile. The clay content of the particle-size control section ranges from 20 to 35 percent.

The A horizon is brown, pinkish gray, light brown, grayish brown, yellowish brown, light brownish gray, pale brown, or light yellowish brown. Reaction ranges from moderately acid to neutral.

The Bt horizon is reddish brown, red, light reddish brown, light red, yellowish red, light reddish brown, light brown, or reddish yellow. It is loam, sandy clay loam, or clay loam. Reaction ranges from moderately acid to moderately alkaline.

Some pedons have a C horizon. This horizon has colors similar to those of the Bt horizon. It is loam, sandy clay loam, or clay loam and may or may not have strata of fine sandy loam or loamy sand. In some pedons the horizon has calcium carbonate in the form of films, threads, and concretions below a depth of 60 inches. In some pedons the horizon has layers of gravel below a depth of 60 inches.

Benchley Series

The Benchley series consists of very deep, very gently sloping or gently sloping, moderately well drained, slowly permeable soils on uplands. These soils formed in marine sediments. Slopes range from 1 to 5 percent. The soils are classified as fine, smectitic, thermic Udertic Argiustolls.

Typical pedon of Benchley clay loam, 1 to 3 percent slopes (fig. 17); from the intersection of Farm Road 46 and Farm Road 391 in Wheelock, 1.1 miles south on Farm Road 46, about 1,350 feet southwest in improved pasture:

Ap—0 to 10 inches; very dark grayish brown (10YR 3/2) clay loam, very dark brown (10YR 2/2) moist; weak fine subangular blocky structure; slightly hard, friable; many fine roots; many fine pores; about 1 percent rounded ironstone pebbles; slightly acid; clear smooth boundary.

A—10 to 13 inches; dark grayish brown (10YR 4/2) clay loam, very dark brown (10YR 2/2) moist; moderate fine subangular blocky structure; slightly hard, friable; common fine roots; common fine pores; few medium prominent yellowish red (5YR 4/6) masses of iron accumulation; about 2 percent rounded ironstone pebbles; moderately acid; clear smooth boundary.



Figure 17.—Profile of Benchley clay loam. An accumulation of organic matter is evident in the thick, dark surface layer.

- Bt—13 to 20 inches; very dark grayish brown (10YR 3/2) clay loam, very dark brown (10YR 2/2) moist; moderate medium subangular blocky structure; hard, firm; common fine roots; common fine pores; few distinct clay films on faces of peds; about 1 percent rounded ironstone pebbles; common coarse prominent red (2.5YR 4/6) and few medium prominent yellowish brown (10YR 5/8) masses of iron accumulation; moderately acid; clear wavy boundary.
- Btss1—20 to 28 inches; red (2.5YR 5/6) clay, red (2.5YR 4/6) moist; moderate medium angular blocky structure; very hard, firm; few fine roots; few fine pores; few distinct pressure faces; few distinct slickensides; few distinct clay films on faces of peds and surfaces along pores; about 1 percent rounded ironstone pebbles; many fine

prominent light olive brown (2.5Y 5/3) masses of iron accumulation; moderately acid; gradual wavy boundary.

Btss2—28 to 36 inches; brownish yellow (10YR 6/6) clay, yellowish brown (10YR 5/6) moist; moderate medium angular blocky structure; very hard, very firm; few fine roots; few fine pores; common distinct pressure faces; common distinct slickensides; few distinct clay films on faces of peds and on surfaces along pores; less than 1 percent rounded ironstone pebbles; common coarse prominent red (10R 4/6) masses of iron accumulation; moderately acid; clear wavy boundary.

Btss3—36 to 42 inches; brownish yellow (10YR 6/6) clay, yellowish brown (10YR 5/6) moist; moderate medium angular blocky structure; very hard, very firm; few fine roots; few fine pores; common distinct slickensides; few distinct clay films on faces of peds and surfaces along pores; less than 1 percent rounded ironstone pebbles; common fine prominent yellowish red (5YR 5/8) masses of iron accumulation; slightly acid; gradual wavy boundary.

Btss4—42 to 54 inches; light olive brown (2.5Y 5/4) clay, olive brown (2.5Y 4/4) moist; moderate medium angular blocky structure; very hard, very firm; few fine roots; few fine pores; common distinct slickensides; few distinct clay films on faces of peds and surfaces along pores; neutral; gradual smooth boundary.

BCt—54 to 64 inches; yellowish brown (10YR 5/6) clay, dark yellowish brown (10YR 4/6) moist; weak medium angular blocky structure; very hard, very firm; few distinct clay films on faces of peds; thin strata of light gray (10YR 7/1) shale; few fine faint light brown (7.5YR 6/4) masses of iron accumulation; neutral; clear smooth boundary.

C—64 to 80 inches; light gray (10YR 7/1) shale, gray (10YR 6/1) moist; stratified with yellowish red (5YR 5/8) sandy clay; massive; very hard, firm; neutral.

The solum is 60 to more than 80 inches thick. Rounded ironstone pebbles range from none to 5 percent throughout the profile. When the soil is dry, cracks 0.5 inch wide extend to a depth of more than 20 inches. Slickensides are few or common below a depth of 20 inches. Clay content of the particle-size control section ranges from 40 to 55 percent.

The Ap horizon is very dark grayish brown, very dark brown, very dark gray, or dark brown. Reaction ranges from moderately acid to neutral.

The A horizon is very dark grayish brown, dark grayish brown, very dark brown, very dark gray, or dark brown. Texture is clay loam or loam. Reaction ranges from moderately acid to neutral. The combined thickness of the Ap and A horizons is 10 to 15 inches.

The Bt horizon is very dark grayish brown, dark brown, or brown. Texture is clay loam or clay. The horizon has none to common redoximorphic features in shades of brown, red, or yellow. Some pedons have a mottled matrix with these colors. Reaction ranges from moderately acid to neutral.

The Btss horizon is red, reddish brown, yellowish red, brown, brownish yellow, or dark brown. Texture is clay loam or clay. The horizon has few to many redoximorphic features in shades of olive, brown, red, or yellow. In some pedons there is a mottled matrix with these colors. Slickensides are few or common. Reaction ranges from moderately acid to slightly alkaline.

The BCt horizon is light yellowish brown, yellowish brown, brownish yellow, or olive. It has few or common redoximorphic features in shades of red, yellow, brown, or gray. Texture is clay loam or clay. Calcium sulfate crystals and calcium carbonate concretions range from none to common. Reaction ranges from slightly acid to moderately alkaline.

The C horizon is horizontally bedded shale. Thin strata of weakly cemented sandstone and loamy and clayey material are in most pedons in shades of brown, yellow, olive, or gray. The content of calcium sulfate crystals and calcium carbonate

concretions ranges from none to common. Reaction ranges from slightly acid to moderately alkaline.

Bremond Series

The Bremond series consists of very deep, nearly level or very gently sloping, moderately well drained, very slowly permeable soils on stream terraces and relict terraces on uplands. These soils formed in alkaline clayey sediments. Slopes range from 0 to 3 percent. The soils are classified as fine, smectitic, thermic Udertic Paleustalfs.

Typical pedon of Bremond fine sandy loam, 1 to 3 percent slopes; from the intersection of U.S. Highway 79 and Farm Road 46 in Franklin, 4.0 miles north on Farm Road 46, about 3.6 miles west on Farm Road 979, about 340 feet south in pasture:

Ap—0 to 7 inches; yellowish brown (10YR 5/4) fine sandy loam, dark yellowish brown (10YR 4/4) moist; moderate fine subangular blocky structure; slightly hard, friable; few fine roots; strongly acid; abrupt wavy boundary.

Bt—7 to 14 inches; reddish brown (5YR 4/4) clay, dark reddish brown (5YR 3/4) moist; moderate medium angular blocky structure; very hard, firm; few fine roots; few fine pores; common distinct pressure faces; common distinct clay films on faces of peds; common fine distinct dark red (2.5YR 3/6) and red (2.5YR 4/8) masses of iron accumulation; moderately acid; gradual wavy boundary.

Btss1—14 to 31 inches; light olive brown (2.5Y 5/3) clay, olive brown (2.5Y 4/3) moist; moderate medium angular blocky structure; very hard, firm; few fine roots; few fine pores; common distinct pressure faces; few distinct slickensides; common distinct clay films on faces of peds; about 1 percent rounded ironstone pebbles; few fine distinct yellowish brown (10YR 5/6) masses of iron accumulation; neutral; gradual wavy boundary.

Btss2—31 to 50 inches; brown (10YR 5/3) clay, dark brown (10YR 4/3) moist; moderate coarse prismatic structure; very hard, firm; few fine roots; few fine pores; common distinct pressure faces; few distinct slickensides; common distinct clay films on faces of peds; few medium distinct olive yellow (2.5Y 6/8) and few fine prominent red (2.5YR 4/8) masses of iron accumulation; slightly alkaline; gradual wavy boundary.

Btss3—50 to 65 inches; brownish yellow (10YR 6/6) clay, yellowish brown (10YR 5/6) moist; moderate coarse prismatic structure; very hard, firm; few fine roots; few distinct pressure faces; few distinct slickensides; few distinct clay films on faces of peds; few fine calcium carbonate concretions; common medium distinct light brownish gray (10YR 6/2) iron depletions; few fine prominent red (2.5YR 4/8) masses of iron accumulation; neutral; clear wavy boundary.

2BCt—65 to 80 inches; yellowish brown (10YR 5/6) clay loam, dark yellowish brown (10YR 4/6) moist; weak coarse prismatic structure; hard, friable; few distinct clay films on faces of peds; about 1 percent fine and medium rounded ironstone pebbles; common medium distinct light brownish gray (10YR 6/2) iron depletions; few fine distinct yellowish brown (10YR 5/8) masses of iron accumulation; neutral.

The solum is 60 to more than 80 inches thick. The content of rounded siliceous or ironstone pebbles ranges from 1 to 5 percent throughout the profile. The clay content of the particle-size control section ranges from 40 to 50 percent.

The A horizon is yellowish brown, dark yellowish brown, brown, dark brown, grayish brown, or dark grayish brown. Reaction ranges from moderately acid to neutral.

The Bt horizon is reddish brown, dark yellowish brown, or brown. Texture is clay. The horizon has few or common redoximorphic concentrations in shades of red, brown, or olive. Reaction ranges from moderately acid to neutral.

The Btss horizon is dark yellowish brown, brown, yellowish brown, brownish yellow, pale brown, olive brown, light olive brown, or light yellowish brown. Texture is clay loam or clay. The horizon has few to many redoximorphic concentrations in shades of red, brown, or yellow. The lower part of the horizon has none to common redoximorphic depletions in shades of gray. Slickensides are few or common. Reaction ranges from slightly acid to moderately alkaline.

The BCt horizon is dark yellowish brown, brown, yellowish brown, or light olive brown. Texture is sandy clay loam, clay loam, or clay. The horizon has few to many redoximorphic features in shades of brown, yellow, red, or gray. Concretions and masses of calcium carbonate range from very few to common. Reaction ranges from neutral to moderately alkaline.

Burleson Series

The Burleson series consists of very deep, nearly level, moderately well drained, very slowly permeable soils on stream terraces. These soils formed in alkaline clayey sediments. Slopes are 0 to 1 percent. The soils are classified as fine, smectitic, thermic Udic Haplusterts.

Typical pedon of Burleson clay, 0 to 1 percent slopes; from the intersection of Farm Road 1694 and Texas Highway 6 in Calvert, 4.7 miles north on Texas Highway 6, about 5.2 miles north-northwest on Farm Road 2159, about 0.9 mile west on a private road, 500 feet north in improved pasture:

- Ap—0 to 7 inches; dark gray (10YR 4/1) clay, very dark gray (10YR 3/1) moist; moderate medium subangular blocky structure; extremely hard, very firm; very sticky, very plastic; common fine roots; few fine iron manganese concretions; moderately acid; gradual wavy boundary.
- Bss1—7 to 32 inches; very dark gray (10YR 3/1) clay, black (10YR 2/1) moist; moderate medium angular blocky structure; extremely hard, very firm; very sticky, very plastic; few fine roots; common prominent slickensides; few fine iron-manganese concretions; neutral; gradual wavy boundary.
- Bss2—32 to 55 inches; dark gray (10YR 4/1) clay, very dark gray (10YR 3/1) moist; moderate medium angular blocky structure; extremely hard, very firm; very sticky, very plastic; few fine roots; many prominent slickensides; few fine iron-manganese concretions; few fine calcium carbonate concretions; black (10YR 2/1) soil material in vertical cracks; moderately alkaline; gradual wavy boundary.
- Bss3—55 to 68 inches; gray (10YR 5/1) clay, dark gray (10YR 4/1) moist; weak medium angular blocky structure; extremely hard, very firm; very sticky, very plastic; few prominent slickensides; few fine iron-manganese concretions; few fine calcium carbonate concretions; thin strata of yellowish red (5YR 4/6) clay; slightly effervescent; moderately alkaline; gradual wavy boundary.
- 2CBk—68 to 80 inches; yellowish red (5YR 5/6) silty clay, yellowish red (5YR 4/6) moist; weak medium angular blocky structure; extremely hard, very firm; very sticky, very plastic; few fine iron-manganese concretions; few fine calcium carbonate concretions; slightly effervescent; moderately alkaline.

The solum is 60 to more than 80 inches thick. The clay content of the particle-size control section ranges from 40 to 60 percent. Undisturbed areas have gilgai microrelief with microknolls 6 to 12 inches higher than microdepressions. When dry, the soil has cracks 1 to 3 inches wide that extend to a depth of 40 inches or more. Slickensides begin at a depth of 8 to 24 inches and extend throughout the solum. The content of iron-manganese concretions and masses is none or few throughout the profile.

The A horizon is very dark gray or black. Reaction ranges from moderately acid to neutral.

The upper part of the Bss horizon, at a depth of 7 to 32 inches, is very dark gray or

black. Texture is clay or silty clay. The content of rounded siliceous pebbles ranges from 0 to about 2 percent. The content of concretions and masses of calcium carbonate ranges from none to common. Reaction ranges from slightly acid to moderately alkaline.

The lower part of Bss horizon, at a depth of 32 to 68 inches, is very dark gray, dark gray, or gray. Texture is clay or silty clay. The content of streaks or spots in shades of red ranges from none to common. The content of rounded siliceous pebbles ranges from 0 to about 5 percent. The content of concretions and masses of calcium carbonate ranges from none to common. Some pedons are strongly effervescent. Reaction is slightly alkaline or moderately alkaline.

The 2CBk horizon is yellowish red, reddish yellow, or reddish brown. Texture is clay loam, silty clay loam, or silty clay. The content of rounded siliceous pebbles ranges from 0 to about 5 percent. The content of iron-manganese concretions ranges from none to common. The content of concretions and masses of calcium carbonate ranges from few to many. Reaction is moderately alkaline with slight to violent effervescence. Some pedons have sandy, loamy, or gravelly strata below a depth of 80 inches.

Cadelake Series

The Cadelake series consists of very deep, nearly level, poorly drained, rapidly permeable soils in poorly defined drainageways and depressed areas on uplands. These soils formed in thick beds of sandy colluvium that are saturated throughout most of the year. Slopes range from 0 to 2 percent. The soils are classified as sandy, siliceous, thermic Typic Humaquepts.

Typical pedon of Cadelake fine sandy loam, 0 to 2 percent slopes; from the intersection of U.S. Highway 79 and Farm Road 1940 in New Baden, 6.5 miles east on U.S. Highway 79, about 5.4 miles southeast on County Road 355, about 0.7 mile southwest on an electric transmission line right-of-way, 200 feet south in a depressional area in rangeland:

- A—0 to 8 inches; very dark gray (N 3/0) fine sandy loam, black (N 2/0) moist; weak fine and medium subangular blocky structure parting to weak fine granular; soft, very friable; many fine and medium roots; common coarse roots; extremely acid; gradual wavy boundary.
- A/Eg—8 to 18 inches; dark gray (N 4/0) loamy fine sand, very dark gray (N 3/0) moist; weak fine and medium subangular blocky structure; soft, very friable; many fine and medium roots; about 20 percent gray (10YR 6/1) loamy fine sand albic materials (Eg part); extremely acid; gradual wavy boundary.
- Bg1—18 to 23 inches; light gray (10YR 7/2) fine sand, grayish brown (10YR 5/2) moist; weak medium and coarse prismatic structure; soft, very friable; common fine roots; very strongly acid; gradual wavy boundary.
- Bg2—23 to 35 inches; light gray (10YR 7/1) fine sand, grayish brown (10YR 5/2) moist; single grain; loose; few fine roots; extremely acid; gradual wavy boundary.
- Bg3—35 to 43 inches; light gray (10YR 7/1) fine sand, light grayish brown (10YR 6/2) moist; single grain; loose; few fine distinct olive yellow (2.5Y 6/8) masses of iron accumulation; extremely acid; gradual wavy boundary.
- Bg4—43 to 80 inches; white (10YR 8/1) fine sand, light gray (10YR 7/2) moist; single grain; loose; few medium distinct olive yellow (2.5Y 6/6) masses of iron accumulation; very strongly acid.

The solum is more than 80 inches thick. Reaction ranges from extremely acid to moderately acid.

The A horizon is black or very dark gray.

The A/Eg horizon is dark gray or very dark gray. Texture is loamy fine sand or fine

sandy loam. The content of redoximorphic depletions in the form of small masses of gray albic materials ranges from 10 to 20 percent.

The Bg horizon is grayish brown, light gray, or white. Texture is fine sand or loamy fine sand. The horizon has none to common redoximorphic concentrations in shades of yellow.

Chazos Series

The Chazos series consists of very deep, very gently sloping or gently sloping, moderately well drained, slowly permeable soils on stream terraces. These soils formed in alkaline clayey and loamy alluvial sediments. Slopes range from 1 to 5 percent. The soils are classified as fine, smectitic, thermic Udic Paleustalfs.

Typical pedon of Chazos loamy fine sand, 1 to 5 percent slopes; from the intersection of Farm Road 46 and Farm Road 2446 in Franklin, 2.3 miles southeast on Farm Road 2446, about 0.6 mile south on County Road 314, about 700 feet west in improved pasture:

- Ap—0 to 6 inches; yellowish brown (10YR 5/4) loamy fine sand, dark yellowish brown (10YR 4/4) moist; weak fine granular structure; slightly hard, very friable; common fine and medium roots; slightly acid; clear smooth boundary.
- E—6 to 14 inches; light yellowish brown (10YR 6/4) loamy fine sand, yellowish brown (10YR 5/4) moist; weak fine granular structure; slightly hard, very friable; common fine and medium roots; slightly acid; abrupt wavy boundary.
- Bt1—14 to 22 inches; strong brown (7.5YR 5/6) clay, strong brown (7.5YR 4/6) moist; moderate medium prismatic structure parting to moderate medium angular blocky; very hard, firm; common fine roots; common fine pores; common distinct clay films on faces of peds; few clean sand grains along prism faces; many fine and medium prominent red (2.5YR 4/6) and common fine and medium distinct pale brown (10YR 6/3) masses of iron accumulation; moderately acid; gradual wavy boundary.
- Bt2—22 to 35 inches; pale brown (10YR 6/3) clay loam, brown (10YR 5/3) moist; moderate medium prismatic structure parting to moderate medium angular blocky; hard, firm; common fine roots; common fine pores; common distinct clay films on faces of peds; few clean sand grains along prism faces; many fine and medium prominent red (2.5YR 4/8) and dark red (2.5YR 3/6) masses of iron accumulation; few fine faint light brownish gray (10YR 6/2) iron depletions; moderately acid; gradual wavy boundary.
- Bt3—35 to 62 inches; pale brown (10YR 6/3) sandy clay loam, brown (10YR 5/3) moist; moderate medium prismatic structure parting to moderate medium subangular blocky; hard, firm; few fine roots; few fine pores; common distinct clay films on faces of peds; few clean sand grains along prism faces; many fine and medium prominent red (2.5YR 4/8), common fine prominent dark red (2.5YR 3/6), and common medium distinct strong brown (7.5YR 5/8) masses of iron accumulation; common fine and medium distinct light brownish gray (10YR 6/2) iron depletions; moderately acid; gradual wavy boundary.
- BCt—62 to 80 inches; brownish yellow (10YR 6/6) sandy clay loam, yellowish brown (10YR 5/6) moist; weak medium prismatic structure; slightly hard, friable; few distinct clay films on faces of peds; common medium distinct strong brown (7.5YR 5/8) and few fine and medium prominent red (10YR 5/8) masses of iron accumulation; few fine distinct light brownish gray (10YR 6/2) iron depletions; slightly acid.

The solum is more than 80 inches thick. The clay content of the particle-size control section ranges from 35 to 50 percent. The content of rounded siliceous pebbles ranges from 0 to 5 percent throughout the profile.

The A horizon is dark grayish brown, brown, dark yellowish brown, yellowish brown,

or grayish brown. The E horizon is yellowish brown, pale brown, light yellowish brown, or very pale brown. Reaction ranges from moderately acid to neutral. The combined thickness of the A and E horizons ranges from 10 to 20 inches.

The upper part of the Bt horizon is dark yellowish brown, yellowish brown, brownish yellow, strong brown, reddish brown, yellowish red, or red. Texture is clay loam, sandy clay, or clay. This part of the horizon has few to many redoximorphic features in shades of red, yellow, brown, or gray. Reaction ranges from strongly acid to slightly acid.

The lower part of the Bt horizon is grayish brown, light brownish gray, light gray, brown, pale brown, yellowish brown, or brownish yellow. Texture is sandy clay loam, clay loam, or sandy clay. This part of the horizon has few to many redoximorphic features in shades of red, brown, yellow, and gray. In some pedons the horizon has a mixed matrix with these colors. Reaction ranges from moderately acid to neutral.

The BCt horizon is fine sandy loam or sandy clay loam. It is mainly in shades of gray or brown with or without red or yellow redoximorphic features. Reaction ranges from slightly acid to moderately alkaline.

Coarsewood Series

The Coarsewood series consists of very deep, nearly level or very gently sloping, well drained, moderately rapidly permeable soils on flood plains of the Brazos River. These soils formed in calcareous loamy alluvium. Slopes are mainly less than 1 percent but can range to 3 percent. The soils are classified as coarse-silty, mixed, superactive, calcareous, thermic Udic Ustifluvents.

Typical pedon of Coarsewood silt loam, 0 to 1 percent slopes, rarely flooded (fig. 18); from the intersection of Texas Highway 6 and Farm Road 1644 in Calvert, 1.2 miles west on Farm Road 1644, about 4.0 miles west on County Road 112, about 0.6 mile north on a field road, 125 feet north in cropland:

- Ap—0 to 5 inches; brown (7.5YR 5/4) silt loam, brown (7.5YR 4/4) moist; weak fine and medium subangular blocky structure; hard, friable; common fine and few medium roots; few fine snail shell fragments; strongly effervescent; moderately alkaline; clear smooth boundary.
- Bw1—5 to 9 inches; light brown (7.5YR 6/4) silt loam, brown (7.5YR 4/4) moist; weak coarse prismatic structure parting to weak medium subangular blocky; hard, friable; common fine roots; few fine snail shell fragments; strongly effervescent; moderately alkaline; clear smooth boundary.
- Bw2—9 to 19 inches; light yellowish brown (10YR 6/4) silt loam, brown (7.5YR 5/4) moist; weak coarse prismatic structure parting to weak medium subangular blocky; slightly hard, very friable; few fine roots; strongly effervescent; moderately alkaline; clear smooth boundary.
- Bw3—19 to 44 inches; pink (7.5YR 7/4) silt loam, light brown (7.5YR 6/4) moist; weak coarse prismatic structure parting to weak fine subangular blocky; slightly hard, very friable; strongly effervescent; slightly alkaline; clear smooth boundary.
- C1—44 to 59 inches; very pale brown (10YR 7/4) silt loam, light yellowish brown (10YR 6/4) moist; massive; hard, friable; few fine pores; thin strata of brown (10YR 5/3) clay; strongly effervescent; slightly alkaline; gradual wavy boundary.
- C2—59 to 70 inches; light brown (7.5YR 6/4) silt loam, brown (7.5YR 5/4) moist; massive; hard, friable; thin strata of reddish brown (5YR 5/4) clay; strongly effervescent; slightly alkaline; clear smooth boundary.
- C3—70 to 80 inches; reddish yellow (5YR 6/6) silt loam, yellowish red (5YR 5/6) moist; massive; hard, very friable; few fine concretions of calcium carbonate; strongly effervescent; slightly alkaline.

The solum is 40 to about 60 inches thick. The particle-size control section ranges from 10 to 18 percent clay with less than 15 percent sand coarser than very fine sand.

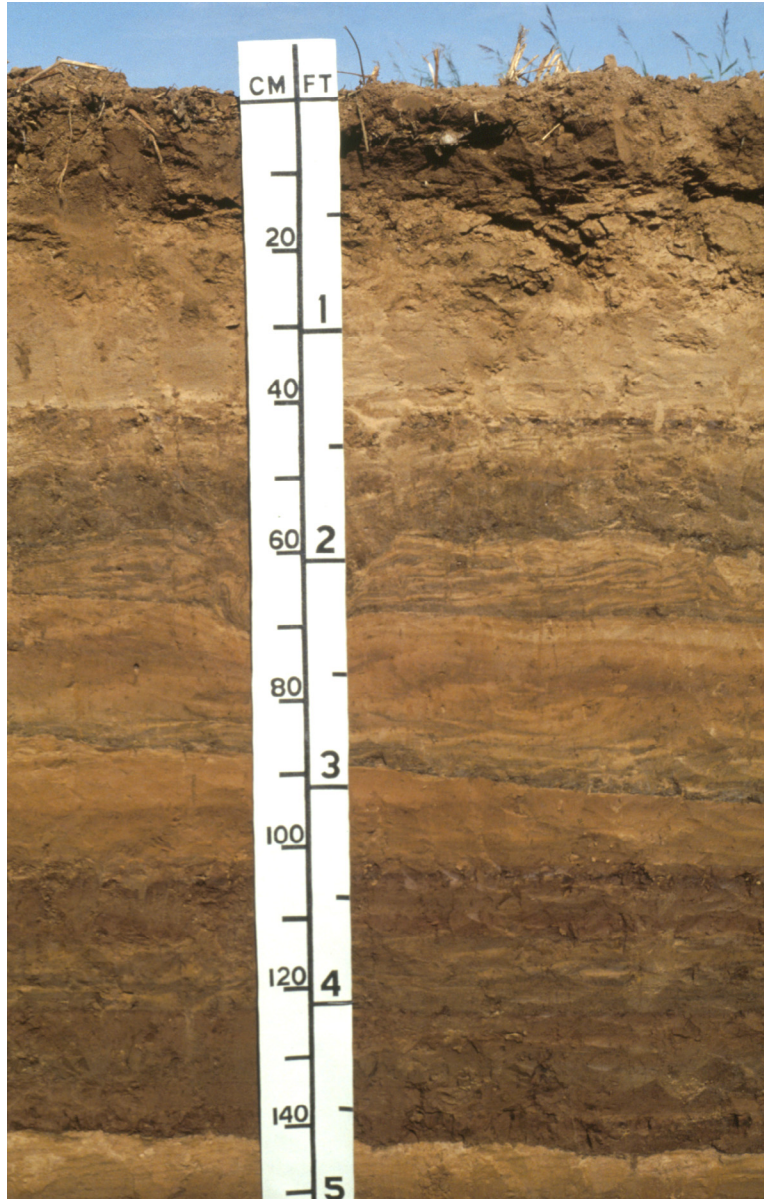


Figure 18.—Profile of Coarsewood silt loam. The stratification indicates past flood events.

The soil is slightly alkaline or moderately alkaline, and effervescence ranges from slight to violent throughout the profile. The content of fragments of snail shells ranges from none to common.

The A horizon is brown or light brown.

The Bw horizon is brown, strong brown, reddish brown, light yellowish brown, yellowish brown, or pink. The matrix is very fine sandy loam, silt loam, or loam. The horizon has few or common strata less than 0.5 inch thick of loamy fine sand, fine sandy loam, or very fine sandy loam in distinct shades of brown.

The C horizon is brown, light brown, reddish yellow, yellowish red, light reddish brown, or pink and is stratified with these colors. In most pedons the horizon has strata, about 0.5 inch to 2.0 inches thick, of very fine sandy loam, silt loam, loam, or

strata that are slightly more sandy or clayey. In some pedons it contain few threads and concretions of calcium carbonate.

Crockett Series

The Crockett series consist of very deep, very gently sloping or gently sloping, moderately well drained, very slowly permeable soils on uplands. These soils formed in marine sediments of alkaline shale and clay. Slopes range from 1 to 5 percent. The soils are classified as fine, smectitic, thermic Udertic Paleustalfs.

Typical pedon of Crockett loam, 1 to 3 percent slopes; from the intersection of Farm Road 2096 and U.S. Highway 79 in Easterly, 10.2 miles north on Farm Road 2096, about 3.6 miles northeast on Farm Road 979, about 3.0 miles northwest on Highway 7, about 2.6 miles west on County Road 457, about 100 feet north in cropland:

- Ap—0 to 7 inches; brown (10YR 5/3) loam, brown (10YR 4/3) moist; weak medium subangular blocky structure; hard, friable; common fine roots; moderately acid; abrupt wavy boundary.
- Bt—7 to 15 inches; prominently and coarsely mottled red (2.5YR 5/8) and brown (10YR 5/3) clay; moderate medium angular blocky structure; extremely hard, very firm; few fine roots; few fine pores; few faint pressure faces; few distinct clay films on faces of peds; few vertical cracks filled with brown (10YR 5/3) (A horizon) material; moderately acid; clear smooth boundary.
- Btss1—15 to 26 inches; distinctly and coarsely mottled light olive brown (2.5Y 5/4) and brown (10YR 5/3) clay; moderate medium angular blocky structure; extremely hard, very firm; few fine roots; few fine pores; few distinct pressure faces; few distinct slickensides; few distinct clay films on faces of peds; neutral; gradual wavy boundary.
- Btss2—26 to 32 inches; olive brown (2.5Y 4/3) clay, dark olive brown (2.5Y 3/3) moist; moderate medium angular blocky structure; extremely hard, very firm; few fine roots; few distinct slickensides; common distinct clay films on faces of peds; common coarse distinct olive yellow (2.5Y 6/6) and few fine prominent yellowish brown (10YR 5/8) masses of iron accumulation; slightly acid; gradual wavy boundary.
- Btss3—32 to 48 inches; light olive brown (2.5Y 5/3) clay, olive brown (2.5Y 4/3) moist; strong medium angular blocky structure; extremely hard, very firm; few fine roots; common distinct slickensides; common distinct clay films on faces of peds; few medium distinct olive yellow (2.5Y 6/6) masses of iron accumulation; neutral; gradual wavy boundary.
- BCtk—48 to 55 inches; coarsely mottled yellow (2.5Y 7/6), light olive brown (2.5Y 5/4), and light yellowish brown (2.5Y 6/4) clay loam; moderate medium subangular blocky structure; very hard, firm; few fine roots; few distinct clay films on faces of peds; few fine concretions and masses of calcium carbonate; slightly alkaline; clear smooth boundary.
- C—55 to 80 inches; light gray (5Y 7/1) interbedded weakly cemented shale, gray (5Y 6/1) moist; massive; very hard, firm; few medium prominent brownish yellow (10YR 6/6) and yellow (2.5Y 7/6) masses of iron accumulation; slightly alkaline.

The solum is 40 to 60 inches thick. The Btss horizon has few or common pressure faces and slickensides throughout. The clay content of the particle-size control section ranges from 40 to 50 percent.

The Ap horizon is typically less than 10 inches thick; however, it can be as much as 15 inches thick in subsoil troughs. The A horizon is dark grayish brown, grayish brown, or brown. The content of rounded ironstone and siliceous pebbles ranges from 0 to 5 percent. Reaction ranges from moderately acid to neutral.

The Bt horizon is dominantly mottled in red, dark reddish brown, reddish brown,

dark yellowish brown, or brown. It has few or common redoximorphic features in shades of brown, yellow, red, or olive. The content of rounded ironstone and siliceous pebbles ranges from 0 to 5 percent. Reaction ranges from moderately acid to neutral.

The Btss horizon is brown, dark olive brown, olive brown, light olive brown, or olive yellow. It has none to common redoximorphic concentrations in shades of red, yellow, or brown. Reaction ranges from slightly acid to moderately alkaline.

The BCtk horizon is clay loam or clay with or without weathered shale fragments. It has a mottled matrix in shades of brown, olive, gray, or yellow and none to common redoximorphic features with these colors. The content of concretions and masses of calcium carbonate ranges from none to common. Reaction ranges from neutral to moderately alkaline.

The C horizon is in shades of brown, olive, or gray. It is mainly weakly cemented shale stratified with soil material that is loam, sandy clay loam, or clay. In some pedons the horizon has thin strata of weakly cemented sandstone. The content of calcium carbonate concretions and masses ranges from none to many. Reaction ranges from neutral to moderately alkaline.

Desan Series

The Desan series consists of very deep, very gently sloping or gently sloping, somewhat excessively drained, moderately permeable soils on stream terraces. These soils formed in sandy and loamy alluvial sediments. Slopes range from 1 to 5 percent. The soils are classified as loamy, siliceous, active, thermic Grossarenic Paleustalfs.

Typical pedon of Desan loamy fine sand, 1 to 5 percent slopes; from the intersection of Texas Highway 6 and Farm Road 1644 in Calvert, 1.5 miles west on Farm Road 1644, about 2.25 miles west on County Road 112, about 1.35 miles northeast on a private road, 500 feet north in improved pasture:

- Ap—0 to 10 inches; very pale brown (10YR 7/4) loamy fine sand, yellowish brown (10YR 5/4) moist; single grain; loose, very friable; many fine roots; slightly acid; clear smooth boundary.
- E1—10 to 34 inches; light brown (7.5YR 6/4) loamy fine sand, brown (7.5YR 5/4) moist; single grain; loose, very friable; common fine roots; slightly acid; gradual smooth boundary.
- E2—34 to 62 inches; pink (7.5YR 7/4) loamy fine sand, light brown (7.5YR 6/4) moist; single grain; loose, very friable; few fine roots; slightly acid; abrupt smooth boundary.
- Bt—62 to 80 inches; red (2.5YR 5/8) sandy clay loam, red (2.5YR 4/8) moist; weak coarse prismatic structure parting to moderate medium subangular blocky; hard, friable; few fine roots; few distinct clay films on faces of peds; slightly acid.

The solum is 65 to more than 80 inches thick.

The A horizon is brown, yellowish brown, light yellowish brown, light brown, pale brown, or very pale brown. The E horizon is light brown, pale brown, very pale brown, light yellowish brown, or pink. Reaction ranges from strongly acid to neutral. The combined thickness of the A and E horizons is 40 to 80 inches.

The Bt horizon is red, reddish yellow, or yellowish red. Texture is sandy clay loam or fine sandy loam. The clay content of the particle-size control section ranges from 18 to 35 percent. Reaction ranges from strongly acid to slightly acid.

Dimebox Series

The Dimebox series consists of very deep, very gently sloping, moderately well drained, very slowly permeable soils on uplands. These soils formed in clayey marine

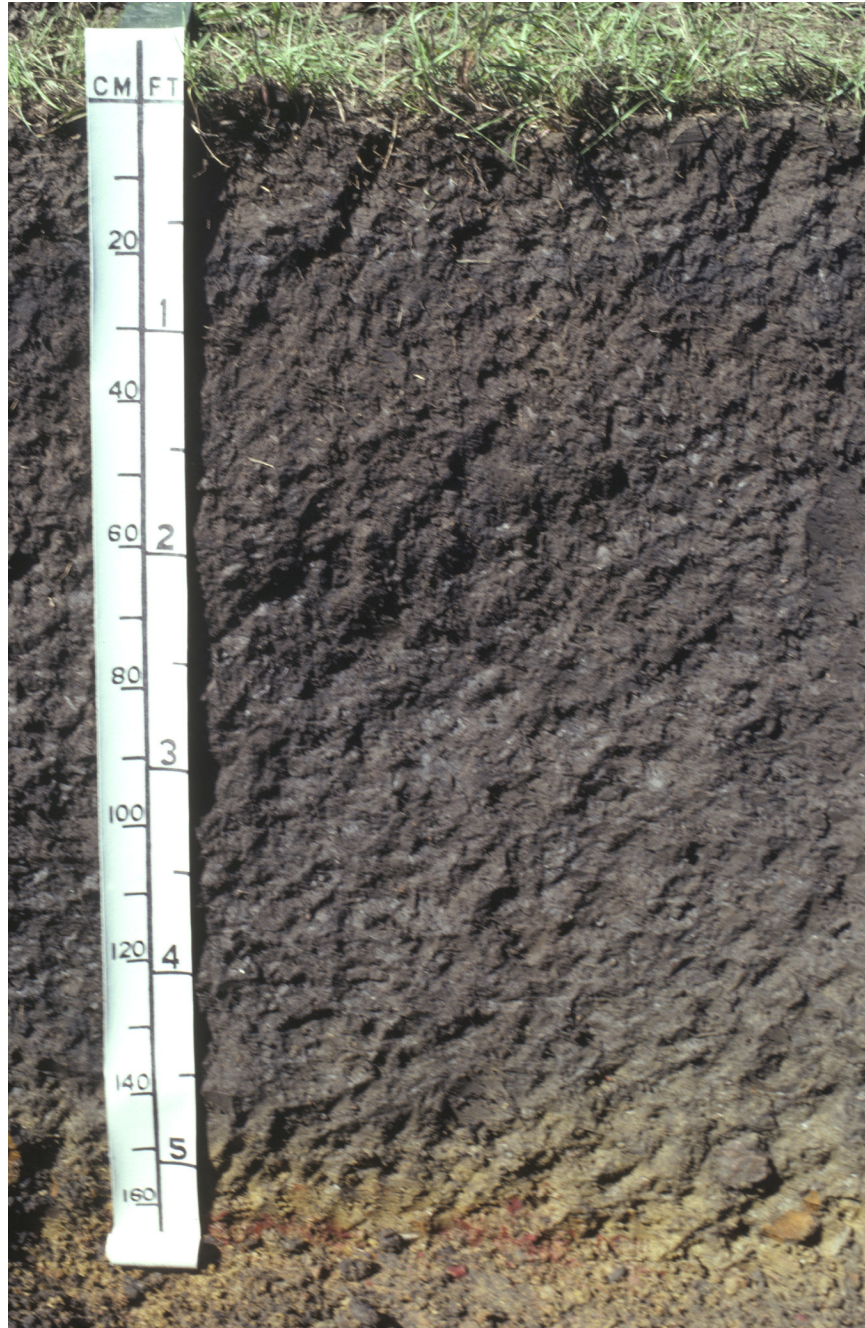


Figure 19.—Profile of Dimebox clay. The texture is clayey throughout.

sediments. Slopes range from 1 to 3 percent. The soils are classified as fine, smectitic, thermic Udic Haplusterts.

Typical pedon of Dimebox clay, 1 to 3 percent slopes (fig. 19); from the intersection of Texas Highway 6 and Old San Antonio Road in Benchley, 1.2 miles northeast on Old San Antonio Road, 0.5 mile north and east on a private road, 150 feet southeast in improved pasture:

Ap—0 to 7 inches; very dark gray (10YR 3/1) clay, black (10YR 2/1) moist; moderate

- medium subangular blocky structure; very hard, very firm; very sticky, very plastic; common fine roots; slightly acid; clear smooth boundary.
- A—7 to 20 inches; very dark gray (N 3/0) clay, black (N 2/0) moist; moderate medium angular blocky structure; very hard, very firm; very sticky, very plastic; common fine roots; few distinct pressure faces; moderately acid; gradual wavy boundary.
- Bss1—20 to 43 inches; very dark gray (10YR 3/1) clay, black (10YR 2/1) moist; strong coarse angular blocky structure; extremely hard, very firm; very sticky, very plastic; common fine roots; common prominent slickensides; common distinct pressure faces; slightly acid; gradual wavy boundary.
- Bss2—43 to 52 inches; very dark grayish brown (2.5Y 3/2) clay, black (2.5Y 2.5/1) moist; moderate coarse angular blocky structure; extremely hard, very firm; very sticky, very plastic; few fine roots; common prominent slickensides; vertical cracks filled with dark gray (10YR 3/1) (B horizon) material; neutral; gradual wavy boundary.
- Bkss—52 to 63 inches; light yellowish brown (2.5Y 6/4) clay, light olive brown (2.5Y 5/4) moist; moderate medium angular blocky structure; extremely hard, very firm; very sticky, very plastic; common prominent slickensides; common fine calcium carbonate concretions; vertical cracks filled with dark gray (10YR 3/1) (B horizon) material; strongly effervescent; slightly alkaline; gradual wavy boundary.
- BCKss—63 to 71 inches; pale yellow (2.5Y 7/4) clay, light yellowish brown (2.5Y 6/4) moist; weak coarse angular blocky structure; very hard, very firm; very sticky, very plastic; few distinct slickensides; few organic stains; common fine calcium carbonate concretions; few fine faint yellowish brown (10YR 5/6) masses of iron accumulation; strongly effervescent; slightly alkaline; clear wavy boundary.
- 2C—71 to 80 inches; pale yellow (2.5Y 7/3) weakly cemented shale stratified with thin layers of weakly cemented sandstone; very hard, very firm; few fine calcium carbonate concretions; about 1 percent rounded ironstone pebbles; brownish yellow (10YR 6/6), dark yellowish brown (10YR 4/6), and olive brown (2.5Y 4/4) masses of iron accumulation; slightly alkaline.

The solum is 60 to more than 80 inches thick. Clay content of the particle-size control section ranges from 40 to 60 percent. Depth to slickensides ranges from 15 to 24 inches. When the soil is dry, cracks 1 to 3 inches wide extend to a depth of 60 inches or more. The content of rounded ironstone and siliceous pebbles ranges from less than 1 percent to about 5 percent throughout the solum.

The Ap and A horizons are very dark gray or black. Reaction ranges from moderately acid to neutral.

The Bss1 horizon is black, very dark gray, or dark gray. It has few or common slickensides. Reaction ranges from strongly acid to neutral.

The Bss2 horizon is very dark gray, very dark grayish brown, dark gray, or gray. It has few to many redoximorphic features in shades of yellow, brown, gray, or olive. The horizon has common or many slickensides, which are a few inches to several feet across. The content of concretions of calcium carbonate and crystals of calcium sulfate is none or few. Reaction ranges from strongly acid to slightly alkaline.

The Bkss and BCKss horizons are in shades of brown, yellow, olive, or gray. They have none to common redoximorphic features in shades of yellow, brown, gray, or olive. The horizons have common or many slickensides, which are a few inches to several feet across. The content of concretions of calcium carbonate is few or common. The content of crystals of calcium sulfate ranges from none to common. Reaction ranges from slightly acid to moderately alkaline.

The 2C horizon is horizontally bedded weakly cemented shale, weakly cemented sandstone, or clay. It is in shades of yellow, brown, gray, or olive. Concretions of calcium carbonate and crystals of calcium sulfate occur in some pedons. Reaction ranges from slightly acid to moderately alkaline.

Dutek Series

The Dutek series consists of very deep, gently sloping to moderately sloping, well drained, moderately permeable soils on stream terraces. These soils formed in loamy and sandy alluvial sediments. Slopes range from 1 to 8 percent. The soils are classified as loamy, siliceous, active, thermic Arenic Haplustalfs.

Typical pedon of Dutek loamy fine sand, 1 to 3 percent slopes; from the intersection of Farm Road 1644 and Texas Highway 6 in Calvert, 1.0 mile west on Farm Road 1644, about 2.25 miles west on County Road 112, about 0.2 mile north on a pasture road, 1,050 feet northeast in improved pasture:

- Ap—0 to 7 inches; very pale brown (10YR 7/3) loamy fine sand, yellowish brown (10YR 5/4) moist; single grain; loose, very friable; many fine roots; about 1 percent rounded siliceous pebbles; slightly acid; clear smooth boundary.
- A—7 to 17 inches; light yellowish brown (10YR 6/4) loamy fine sand, yellowish brown (10YR 5/4) moist; weak fine granular structure; loose, very friable; common fine roots; about 1 percent rounded siliceous pebbles; moderately acid; clear smooth boundary.
- E—17 to 27 inches; very pale brown (10YR 7/4) loamy fine sand, light yellowish brown (10YR 6/4) moist; weak fine granular structure; loose, very friable; few fine roots; about 1 percent rounded siliceous pebbles; slightly acid; abrupt smooth boundary.
- Bt1—27 to 39 inches; red (2.5YR 5/8) sandy clay loam, red (2.5YR 4/8) moist; weak coarse prismatic structure parting to moderate medium subangular blocky; hard, friable; few medium roots; few medium pores; few distinct clay films on faces of peds; about 1 percent rounded siliceous pebbles; few fine faint reddish yellow (5YR 6/6) masses of iron accumulation; moderately acid; gradual smooth boundary.
- Bt2—39 to 51 inches; red (2.5YR 5/8) sandy clay loam, red (2.5YR 4/8) moist; weak coarse prismatic structure parting to moderate medium subangular blocky; hard, friable; few fine roots; few fine pores; few distinct clay films on faces of peds; about 1 percent rounded siliceous pebbles; moderately acid; gradual smooth boundary.
- Bt3—51 to 58 inches; light red (2.5YR 6/8) sandy clay loam, red (2.5YR 5/8) moist; weak fine subangular blocky structure; slightly hard, friable; few fine roots; few fine pores; few distinct clay films on faces of peds; about 3 percent rounded siliceous pebbles; moderately acid; clear smooth boundary.
- 2C—58 to 80 inches; reddish yellow (5YR 6/8) fine sandy loam, yellowish red (5YR 5/8) moist; slightly hard, very friable; about 1 percent rounded siliceous pebbles; moderately acid.

The solum is 60 to more than 80 inches thick. The content of rounded siliceous pebbles ranges from 1 to 5 percent throughout the profile.

The Ap and A horizons are brown, pale brown, light brown, yellowish brown, or light yellowish brown. The E horizon is pale brown, very pale brown, light yellowish brown, or pink. Reaction ranges from moderately acid to neutral. The combined thickness of the A and E horizons is 20 to 40 inches.

The Bt horizon is reddish yellow, yellowish red, light red, or red. The upper part of the Bt horizon is sandy clay loam, clay loam, or sandy clay; the lower part is fine sandy loam, loam, or sandy clay loam. The horizon has none or few redoximorphic concentrations in shades of red and yellow. The clay content of the particle-size control section ranges from 20 to 35 percent. Reaction ranges from very strongly acid to slightly acid.

The 2C horizon is strong brown, reddish yellow, or yellowish red. Texture is loamy fine sand or fine sandy loam. Reaction ranges from strongly acid to neutral.



Figure 20.—Profile of Edge fine sandy loam. Texture and color change between the surface layer and the clay subsoil.

Edge Series

The Edge series consists of very deep, very gently sloping to moderately sloping, well drained, very slowly permeable soils on uplands. These soils formed in mostly loamy and sandy materials derived mainly from the Calvert Bluff and Hooper Members of the Wilcox Formation. Slopes range from 1 to 8 percent. The soils are classified as fine, mixed, active, thermic Udic Paleustalfs.

Typical pedon of Edge fine sandy loam, 1 to 5 percent slopes (fig. 20); from the intersection of U.S. Highway 79 and Farm Road 2096 in Easterly, 8.6 miles north on Farm Road 2096, about 0.4 mile west and 0.1 mile south on a private road, 150 feet west in rangeland:

A—0 to 4 inches; grayish brown (10YR 5/2) fine sandy loam, dark grayish brown

Soil Survey of Robertson County, Texas

- (10YR 4/2) moist; weak fine granular structure; slightly hard, very friable; many fine, medium, and coarse roots; about 1 percent rounded ironstone pebbles; moderately acid; clear smooth boundary.
- E—4 to 12 inches; very pale brown (10YR 7/3) fine sandy loam, pale brown (10YR 6/3) moist; weak fine granular structure; slightly hard, very friable; common fine, medium, and coarse roots; about 1 percent rounded ironstone pebbles; moderately acid; abrupt smooth boundary.
- Bt1—12 to 21 inches; red (2.5YR 5/6) clay, red (2.5YR 4/6) moist; moderate coarse prismatic structure parting to moderate medium subangular blocky; very hard, firm; common fine and few medium roots; few fine pores; common distinct clay films on faces of peds; few fine faint reddish yellow (5YR 6/8) masses of iron accumulation; very strongly acid; clear smooth boundary.
- Bt2—21 to 34 inches; reddish yellow (5YR 6/8) clay, yellowish red (5YR 5/8) moist; moderate coarse prismatic structure parting to moderate medium subangular blocky; very hard, firm; common fine and very fine roots; few fine pores; common distinct clay films on faces of peds; common medium prominent brownish yellow (10YR 6/8) masses of iron accumulation; very strongly acid; gradual smooth boundary.
- Bt3—34 to 46 inches; red (2.5YR 5/6) clay loam, red (2.5YR 4/6) moist; moderate coarse prismatic structure parting to moderate medium subangular blocky; very hard, firm; common fine and very fine roots; few fine pores; common distinct clay films on faces of peds; common coarse prominent brownish yellow (10YR 6/8) masses of iron accumulation; few fine prominent light brownish gray (10YR 6/2) iron depletions; very strongly acid; clear smooth boundary.
- BCt—46 to 50 inches; prominently and coarsely mottled light brownish gray (10YR 6/2), red (2.5YR 5/6), and brownish yellow (10YR 6/6) clay loam; moderate medium subangular blocky structure; very hard, firm; few fine and very fine roots; few fine pores; few distinct clay films on faces of peds; very strongly acid; clear smooth boundary.
- C/B—50 to 74 inches; very pale brown (10YR 7/4) stratified weakly cemented siltstone and sandstone; weak very coarse prismatic structure; very hard, friable; few very fine roots; few medium prominent red (2.5YR 5/8) masses of iron accumulation; few fine distinct light gray (10YR 7/2) iron depletions; strongly acid; gradual smooth boundary.
- C—74 to 80 inches; pale yellow (2.5Y 7/4) weakly cemented siltstone that is stratified with yellowish red (5YR 5/6) and gray (10YR 6/1) fine sandy loam; massive; very hard, friable; moderately acid.

The solum is 40 to 60 inches thick. The clay content of the particle-size control section ranges from 35 to 50 percent.

The A horizon is dark grayish brown, grayish brown, brown, dark yellowish brown, or yellowish brown. The content of rounded ironstone pebbles or fragments ranges from 0 to 10 percent. Reaction ranges from strongly acid to neutral.

The E horizon is pale brown, very pale brown, or light yellowish brown. The content of rounded ironstone pebbles ranges from 0 to 10 percent. Reaction ranges from very strongly acid to slightly acid.

The Bt horizon is dark red, red, dark reddish brown, reddish brown, or yellowish red. Texture is clay loam or clay. In some pedons the horizon has few or common redoximorphic concentrations in shades of red, brown, or yellow or has a matrix that is mottled with these colors. In some pedons chroma of 2 or less occurs in the lower part of the Bt horizon. These colors are considered to be inherited from the parent material, or they are relict redoximorphic features. Reaction ranges from very strongly acid to neutral.

The BCt horizon is sandy clay loam or clay loam. It has a matrix or a mottled matrix in shades of red, brown, yellow, or gray. Thin strata of sandstone, siltstone, or shale

make up less than 15 percent. Reaction ranges from very strongly acid to slightly alkaline.

The C/B and C horizons are stratified weakly cemented siltstone, sandstone, or shale with textures of fine sandy loam, loam, silt loam, or sandy clay loam. The horizons are in shades of yellow, brown, red, or gray. Some pedons have few or common redoximorphic features in these colors. Most pedons have thin strata of interbedded sandy material. The content of fragments of shale and sandstone ranges from 5 to 15 percent in some pedons. Reaction ranges from strongly acid to moderately alkaline.

Eufaula Series

The Eufaula series consists of very deep, very gently sloping or gently sloping, somewhat excessively drained, rapidly permeable soils on stream terraces. These soils formed in sandy alluvial sediments. Slopes range from 1 to 5 percent. The soils are classified as siliceous, thermic Psammentic Paleustalfs.

Typical pedon of Eufaula loamy fine sand, 1 to 5 percent slopes (fig. 21); from the intersection of U.S. Highway 79 and Farm Road 1940 in New Baden, 6.5 miles east on U.S. Highway 79, about 3.2 miles southeast on County Road 355, about 30 feet west in rangeland:

- A—0 to 7 inches; brown (10YR 5/3) loamy fine sand, brown (10YR 4/3) moist; weak fine granular structure; soft, very friable; common coarse and many fine and medium roots; moderately acid; clear smooth boundary.
- E1—7 to 15 inches; pale brown (10YR 6/3) loamy fine sand, brown (10YR 5/3) moist; weak coarse prismatic structure; soft, very friable; few coarse and many fine and medium roots; moderately acid; gradual wavy boundary.
- E2—15 to 31 inches; very pale brown (10YR 7/3) loamy fine sand, pale brown (10YR 6/3) moist; weak coarse prismatic structure; soft, very friable; common fine and medium roots; moderately acid; clear wavy boundary.
- E&Bt1—31 to 46 inches; 85 percent very pale brown (10YR 7/3) loamy fine sand in E part, pale brown (10YR 6/3) moist; weak coarse prismatic structure; soft, very friable; 15 percent lamellae of strong brown (7.5YR 5/6) fine sandy loam in Bt part, strong brown (7.5YR 4/6) moist; massive; slightly hard, friable; coatings of sand grains and some clay bridging in lamellae; lamellae are wavy and horizontally continuous, ranging in thickness from about 0.625 inch in upper part of horizon to 0.25 inch in lower part; strongly acid; clear wavy boundary.
- E&Bt2—46 to 80 inches; 80 percent very pale brown (10YR 7/3) loamy fine sand in E part, pale brown (10YR 6/3) moist; weak coarse prismatic structure; soft, very friable; 20 percent lamellae of strong brown (7.5YR 5/6) fine sandy loam in Bt part, strong brown (7.5YR 4/6) moist; massive; slightly hard, friable; coatings of sand grains and some clay bridging in lamellae; lamellae are wavy and horizontally continuous and about 0.25 inch to 0.75 inch thick; strongly acid.

The solum is more than 80 inches thick.

The A horizon is brown, yellowish brown, or dark yellowish brown. Reaction ranges from moderately acid to neutral.

The E horizon is brown, pale brown, very pale brown, or light yellowish brown. Texture is fine sand or loamy fine sand. Reaction ranges from strongly acid to neutral.

The E part of the E&Bt horizon is pale brown, very pale brown, or light yellowish brown. Texture is fine sand or loamy fine sand. The E material makes up 55 to 85 percent of the horizon.

The Bt part (lamellae) of the E&Bt horizon is strong brown, yellowish red, or red. Texture is fine sand or fine sandy loam. The lamellae are thin, wavy, and generally horizontally continuous. Reaction ranges from strongly acid to slightly acid.

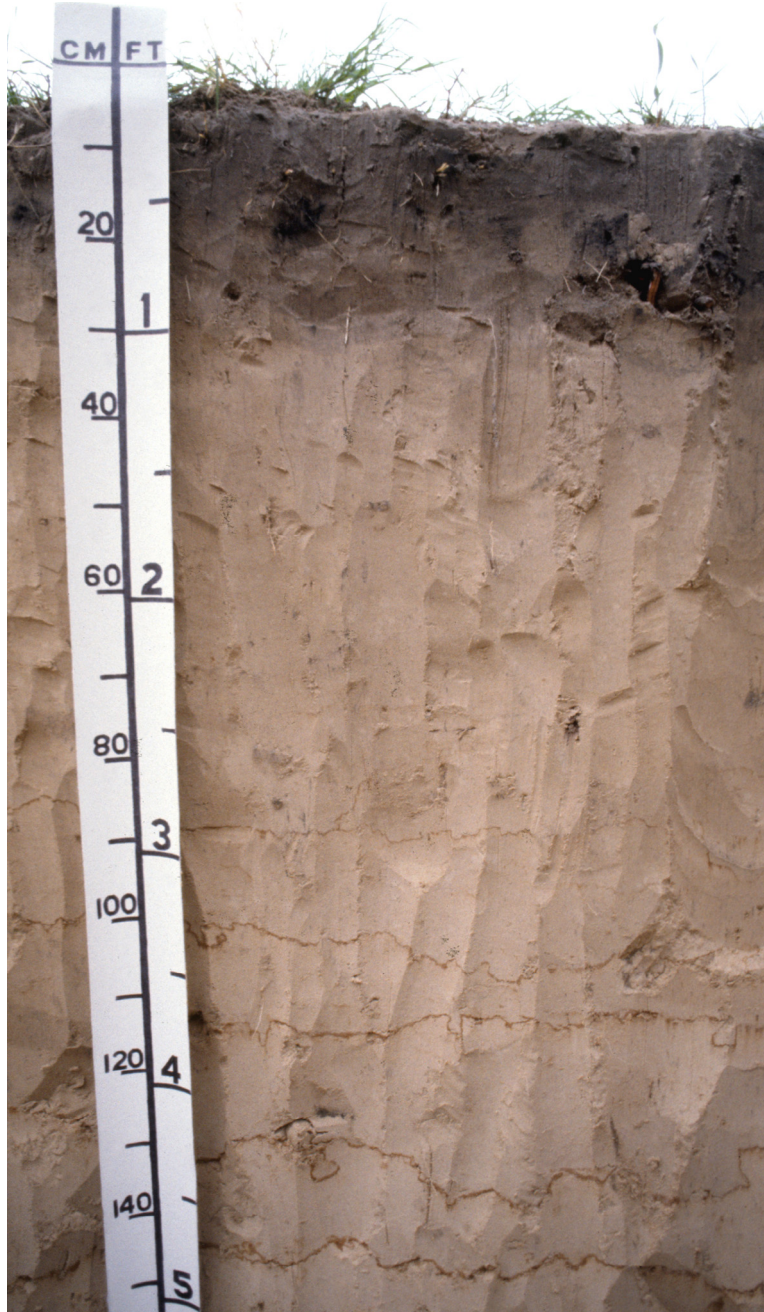


Figure 21.—Profile of Eufaula loamy fine sand. Lamellae begin to occur at a depth of about 3 feet.

Gaddy Series

The Gaddy series consists of very deep, nearly level, somewhat excessively drained, moderately rapidly or rapidly permeable soils on flood plains of the Brazos River. These soils formed in sandy alluvium. Slopes range from 0 to 2 percent. The soils are classified as sandy, mixed, thermic Udic Ustifluvents.

Typical pedon of Gaddy loamy fine sand, 0 to 2 percent slopes, frequently flooded; from the intersection of Texas Highway 6 and Farm Road 979 in Calvert, 3.0 miles

north on Texas Highway 6, about 2.0 miles north on Farm Road 2159, about 3.2 miles west on County Road 408 to a large gravel pit near the Brazos River, 250 feet south in improved pasture:

- Ap—0 to 9 inches; brown (7.5YR 5/4) loamy fine sand, brown (7.5YR 4/4) moist; single grain; loose, very friable; common fine roots; strongly effervescent; slightly alkaline; clear smooth boundary.
- C1—9 to 38 inches; reddish yellow (7.5YR 6/6) fine sand, strong brown (7.5YR 5/6) moist; single grain; loose, very friable; few fine roots; strongly effervescent; moderately alkaline; gradual smooth boundary.
- C2—38 to 57 inches; pink (7.5YR 7/4) fine sand, light brown (7.5YR 6/4) moist; single grain; loose, very friable; strongly effervescent; moderately alkaline; gradual smooth boundary.
- C3—57 to 80 inches; pink (7.5YR 7/4) fine sand, light brown (7.5YR 6/4) moist; single grain; loose, very friable; common thin strata of brown (7.5YR 4/2) silty clay loam about 0.25 to 0.50 inch thick; strongly effervescent to violently effervescent; moderately alkaline.

The soil is moderately alkaline and strongly effervescent to violently effervescent throughout the control section. In some pedons, the A horizon is noneffervescent and slightly alkaline.

The A horizon is brown or light brown.

The C horizon is strong brown, brown, light brown, reddish yellow, or pink. Texture is mainly fine sand or loamy fine sand that has thin strata of more clayey soil.

Gasil Series

The Gasil series consists of very deep, very gently sloping to moderately sloping, well drained, moderately permeable soils on uplands. These soils formed in deeply weathered loamy sediments and sandstone. Slopes range from 1 to 8 percent. The soils are classified as fine-loamy, siliceous, semiactive, thermic Ultic Paleustalfs.

Typical pedon of Gasil loamy fine sand, 1 to 5 percent slopes; from the intersection of U.S. Highway 79 and Farm Road 46 in Franklin, 4.0 miles north on Farm Road 46, about 16.6 miles north on Farm Road 979, about 4.5 miles east on State Highway 7, about 3 miles north on Farm Road 937, about 1.1 miles east on County Road 482, about 700 feet south in rangeland:

- A—0 to 7 inches; brown (10YR 5/3) loamy fine sand, brown (10YR 4/3) moist; weak fine granular structure; soft, very friable; many fine and medium roots; moderately acid; clear smooth boundary.
- E—7 to 15 inches; pale brown (10YR 6/3) loamy fine sand, brown (10YR 5/3) moist; weak fine granular structure; soft, very friable; many fine and medium roots; moderately acid; abrupt wavy boundary.
- Bt1—15 to 26 inches; yellowish brown (10YR 5/6) sandy clay loam, dark yellowish brown (10YR 4/6) moist; moderate medium subangular blocky structure; hard, friable; common fine roots; few distinct clay films on faces of peds; few fine distinct strong brown (7.5YR 5/8) masses of iron accumulation; strongly acid; gradual smooth boundary.
- Bt2—26 to 44 inches; yellowish brown (10YR 5/6) sandy clay loam, dark yellowish brown (10YR 4/6) moist; moderate medium subangular blocky structure; hard, friable; few fine roots; common distinct clay films on faces of peds; common fine prominent yellowish red (5YR 5/8), common fine faint yellowish brown (10YR 5/8), and few fine prominent red (2.5YR 4/8) masses of iron accumulation; moderately acid; clear smooth boundary.
- Bt3—44 to 54 inches; brownish yellow (10YR 6/6) sandy clay loam, yellowish brown

(10YR 5/6) moist; moderate coarse prismatic structure; hard, friable; few fine roots; common distinct clay films on faces of peds; common fine prominent red (2.5YR 4/8) and common fine faint yellowish brown (10YR 5/8) masses of iron accumulation and few medium distinct light brownish gray (10YR 6/2) iron depletions; moderately acid; clear smooth boundary.

Bt4—54 to 74 inches; prominently coarsely mottled yellowish brown (10YR 5/6), red (2.5YR 4/8), and light gray (10YR 7/2) sandy clay loam; moderate coarse prismatic structure; hard, friable; few fine roots; few distinct clay films on faces of peds; moderately acid; gradual smooth boundary.

BCt—74 to 80 inches; brownish yellow (10YR 6/6) fine sandy loam, yellowish brown (10YR 5/6) moist; weak coarse prismatic structure; slightly hard, very friable; few faint clay films on faces of peds; common medium prominent red (2.5YR 5/6) masses of iron accumulation and few fine distinct light brownish gray (10YR 6/2) iron depletions; moderately acid.

The solum is 60 to more than 80 inches thick. The clay content of the particle-size control section ranges from 18 to 30 percent. The content of rounded ironstone pebbles ranges from 0 to about 5 percent throughout the profile. Base saturation ranges from 35 to 65 percent.

The A horizon is dark grayish brown, brown, dark yellowish brown, grayish brown, or yellowish brown. The E horizon is brown, yellowish brown, pale brown, very pale brown, reddish yellow, or pink. Reaction ranges from moderately acid to slightly alkaline. The combined thickness of the A and E horizons ranges from 10 to 20 inches.

The Bt horizon is yellowish brown, light yellowish brown, brownish yellow, brown, or light brown. Texture is sandy clay loam or loam. The horizon has none or many redoximorphic concentrations in shades of red, yellow, or brown. It has none or few redoximorphic depletions in shades of gray below a depth of 30 inches. Reaction ranges from strongly acid to slightly acid.

The BCt horizon is yellow, brownish yellow, or yellowish brown. Texture is fine sandy loam, loam, or sandy clay loam. The horizon has few or common redoximorphic features in shades of red, yellow, or gray. Reaction ranges from strongly acid to neutral.

Hammond Series

The Hammond series consists of very deep, very gently sloping to moderately steep, well drained, slowly permeable soils on uplands. These soils developed in reconstructed materials resulting from lignite surface-mining operations. Slopes range from 1 to 15 percent. The soils are classified as fine-loamy, mixed, superactive, nonacid, thermic Udic Ustorthents.

Typical pedon of Hammond fine sandy loam, 1 to 3 percent slopes; from the intersection of Texas Highway 14 and Farm Road 46 in Bremond, 1.7 miles west on Texas Highway 14, about 3.6 miles south on County Road 426, about 1,000 feet west in improved pasture:

A—0 to 8 inches; brown (10YR 5/3) fine sandy loam, dark brown (10YR 3/3) moist; weak medium subangular blocky structure parting to weak fine granular; hard, friable; common fine and medium roots; few medium aggregates with loam and clay loam texture; neutral; abrupt wavy boundary.

C1—8 to 13 inches; gray (10YR 5/1) clay loam, dark gray (10YR 4/1) moist; massive, mixed with weak fine and medium subangular blocky structure; very hard, firm; common fine and medium distinct yellowish brown (10YR 5/4) and brownish yellow (10YR 6/8) and few fine faint gray (10YR 6/1) masses and aggregates of soil and geologic material that have loam and clay loam texture; common fine

- roots; few fine lignite fragments; few fine mica flakes; few medium very dark gray (10YR 3/1) shale fragments; slightly alkaline; clear wavy boundary.
- C2—13 to 36 inches; light yellowish brown (2.5Y 6/3) clay loam, light olive brown (2.5Y 5/3) moist; massive, mixed with weak fine and medium subangular blocky structure; hard, friable; common fine distinct brownish yellow (10YR 6/8), few fine and medium distinct light gray (2.5Y 7/1), and few fine distinct dark grayish brown (10YR 4/2) masses and aggregates of native soil and geologic material; few fine roots; few fine lignite fragments; few fine and medium ironstone fragments; few fine mica flakes; few fine and medium grayish brown (10YR 5/2) shale fragments; slightly alkaline; diffuse wavy boundary.
- C3—36 to 48 inches; light yellowish brown (2.5Y 6/3) clay loam, light olive brown (2.5Y 5/3) moist; massive, mixed with fine and medium subangular blocky structure; hard, firm; few fine roots; few fine strata of clay; few fine and medium distinct light gray (2.5Y 7/1) and yellowish brown (10YR 5/8) masses and aggregates of native soil and geologic material; common fine lignite fragments; few fine ironstone concretions; few fine and medium grayish brown (2.5Y 5/2) and very dark gray (10YR 3/1) shale fragments; slightly alkaline; gradual wavy boundary.
- C4—48 to 60 inches; light gray (2.5Y 7/2) clay loam, light brownish gray (2.5Y 6/2) moist; massive, mixed with weak coarse platy structure parting to weak fine and medium subangular blocky; hard, firm; common fine and medium distinct yellowish brown (10YR 5/6) and dark grayish brown (10YR 4/2) masses and aggregates of native soil and geologic material; few fine roots; few fine and medium aggregates of loam and clay loam texture; common fine lignite fragments; common fine and medium dark gray (10YR 4/1), grayish brown (10YR 5/2), and yellowish brown (10YR 5/4) shale fragments; slightly alkaline; gradual wavy boundary.
- C5—60 to 80 inches; light yellowish brown (2.5Y 6/3) clay loam, light olive brown (2.5Y 5/3) moist; massive, mixed with weak fine and medium subangular blocky structure; hard, friable; common fine distinct brownish yellow (10YR 6/8) and grayish brown (10YR 5/2) masses and aggregates of native soil and geologic material; few fine roots; few fine lignite fragments; few fine and medium grayish brown (10YR 5/2) shale fragments; slightly alkaline.

The combined thickness of the A and C horizons is more than 80 inches. The surface layer is composed mainly of the topsoil material that was removed from the native soils and stockpiled. Blocky masses and aggregates of the C horizon are relict original soil and geologic materials. The content of lignite fragments, ironstone fragments, and mica flakes ranges from 0 to about 3 percent in most pedons. Clay content of the particle-size control section ranges from 20 to 35 percent. Textures are mixed and variable within short distances.

The A horizon is dark grayish brown, grayish brown, dark brown, brown, dark yellowish brown, or yellowish brown. It has few or common masses and aggregates of soil material in shades of brown or yellow. The clay content ranges from 15 to 25 percent. Reaction ranges from slightly acid to slightly alkaline.

The C horizon is in shades of gray, brown, yellow, or olive. The content of lignite and ironstone fragments varies within each horizon. The horizon has none to common relict masses, aggregates, or redoximorphic features from the native soil in shades of red, yellow, brown, or gray. It is mainly clay loam but includes loam. Some pedons contain discontinuous layers, streaks, or masses of loamy sand, fine sandy loam, silty clay, or clay. Reaction is neutral or slightly alkaline.

Hearne Series

The Hearne series consists of very deep, very gently sloping to moderately steep, well drained, slowly permeable soils on uplands. These soils formed in acidic, stratified

loamy and clayey residuum from soft sandstone and shale. Slopes range from 1 to 20 percent. The soils are classified as fine, mixed, semiactive, thermic Typic Haplustults.

Typical pedon of Hearne fine sandy loam, 3 to 8 percent slopes; from the intersection of U.S. Highway 79 and Farm Road 46 in Franklin, 3.3 miles southwest on U.S. Highway 79, about 75 feet north in rangeland:

- A—0 to 7 inches; brown (7.5YR 5/4) fine sandy loam, dark reddish brown (5YR 3/4) moist; weak medium subangular blocky structure; slightly hard, friable; about 3 percent rounded and flat ironstone pebbles; common fine and medium roots; few wormcasts; strongly acid; clear wavy boundary.
- E—7 to 10 inches; light brown (7.5YR 6/4) fine sandy loam, reddish brown (5YR 4/4) moist; weak fine granular structure; slightly hard, friable; about 5 percent rounded and flat ironstone pebbles; common fine and medium roots; few wormcasts; strongly acid; clear smooth boundary.
- Bt1—10 to 18 inches; red (2.5YR 4/6) clay, dark red (2.5YR 3/6) moist; strong medium angular blocky structure; very hard, very firm; about 1 percent ironstone pebbles; common fine and medium roots; few wormcasts; common distinct clay films on faces of peds; extremely acid; gradual smooth boundary.
- Bt2—18 to 25 inches; red (2.5YR 5/6) clay, red (2.5YR 4/6) moist; strong medium angular blocky structure; very hard, very firm; about 1 percent ironstone pebbles; few fine roots; common distinct clay films on faces of peds; common fine prominent grayish brown (10YR 5/2) lithochromic mottles and few fine faint red (2.5YR 4/8) iron accumulations; extremely acid; gradual smooth boundary.
- BC—25 to 31 inches; red (2.5YR 5/6) clay, red (2.5YR 4/6) moist; moderate medium angular blocky and medium platy structure; hard, firm; vertical faces of peds are coated with few distinct clay films; common flakes of mica; few fine roots; partially weathered horizontal layers of light brownish gray (10YR 6/2) shale with red (2.5YR 4/8) and yellowish red (5YR 5/8) weakly cemented sandstone; extremely acid; gradual wavy boundary.
- C1—31 to 37 inches; thinly stratified light gray (10YR 7/2) shale and red (2.5YR 5/6) and yellowish red (5YR 5/6) weakly cemented sandstone; hard, firm; few red distinct clay films on broken shale masses; common flakes of mica; extremely acid; gradual smooth boundary.
- C2—37 to 72 inches; thinly stratified light gray (10YR 7/2) shale and brownish yellow (10YR 6/8) and red (2.5YR 4/6) weakly cemented sandstone; hard, firm; common fine flakes of mica; extremely acid; gradual smooth boundary.
- C3—72 to 80 inches; thinly stratified light gray (10YR 7/2) and red (2.5YR 4/6) shale and brownish yellow (10YR 6/8) and yellow (10YR 7/8) weakly cemented sandstone; hard, firm; extremely acid.

The solum is 20 to 40 inches thick. Base saturation at a depth of 50 inches below the top of the argillic horizon ranges from 13 to 35 percent.

The A horizon is dark grayish brown, brown, dark yellowish brown, yellowish brown, or reddish brown. The E horizon is pale brown, light yellowish brown, light brown, or very pale brown. The E horizon is discontinuous in some pedons. The A and E horizons are fine sandy loam or its gravelly counterparts. The content of fragments of ironstone, mainly gravel, cobbles, and stones, ranges from 1 to 35 percent. Some pedons contain boulders 2 to 3 feet in diameter. Reaction ranges from very strongly acid to slightly acid.

The Bt horizon is red, light red, yellowish red, or reddish yellow. The horizon has none or few redoximorphic features in shades of red, brown, and gray in the upper part and few to many in the lower part. The gray redoximorphic features are inherited from

the partially weathered gray shale. Texture is clay or sandy clay. The clay content of the particle-size control section ranges from 35 to 60 percent. The content of ironstone pebbles ranges from 1 to 10 percent. Reaction ranges from extremely acid to strongly acid.

The C horizon is stratified or interbedded sandy loam, clay loam, weakly cemented sandstone or soil material weathered from shale. The amount of sandstone or shale is variable and not present in some pedons. Roots penetrate the materials; however, they are mainly concentrated along fractures or cleavage planes. The loamy materials and sandstone are in shades of red, yellow, or brown, and the shale is mainly in shades of gray. Few or common flakes of mica are visible mostly along cleavage planes between strata. Reaction ranges from extremely acid to strongly acid.

Highbank Series

The Highbank series consists of very deep, nearly level, well drained, slowly permeable soils on flood plains of the Brazos River. These soils formed in loamy and clayey alluvium. Slopes are 0 to 1 percent. The soils are classified as fine, mixed, active, thermic Udertic Haplustepts.

Typical pedon of Highbank silty clay loam, 0 to 1 percent slopes, rarely flooded; from the intersection of Farm Road 50 and County Road 203 in Mumford, 2.2 miles north on Farm Road 50, about 1.16 miles east on a field road, 100 feet south in cropland:

- Ap—0 to 6 inches; brown (7.5YR 5/4) silty clay loam, brown (7.5YR 4/4) moist; weak fine granular structure; hard, firm; common fine roots; common fine pores; strongly effervescent; slightly alkaline; abrupt smooth boundary.
- A—6 to 17 inches; brown (7.5YR 5/4) silty clay loam, brown (7.5YR 4/4) moist; weak fine subangular blocky structure; hard, firm; common fine roots; common fine pores; strongly effervescent; slightly alkaline; abrupt smooth boundary.
- Bw1—17 to 33 inches; reddish brown (5YR 4/3) clay, dark reddish brown (5YR 3/3) moist; moderate medium subangular blocky structure; very hard, firm; few fine roots; common fine pores; common distinct pressure faces; few bedding planes; strongly effervescent; slightly alkaline; abrupt smooth boundary.
- Bw2—33 to 44 inches; light reddish brown (5YR 6/4) clay, reddish brown (5YR 4/4) moist; moderate medium angular blocky structure; very hard, firm; few fine roots; few fine pores; common distinct pressure faces; strongly effervescent; slightly alkaline; clear smooth boundary.
- Bw3—44 to 54 inches; reddish brown (5YR 5/4) clay, reddish brown (5YR 4/4) moist; moderate fine angular blocky structure; very hard, very firm; few very fine roots and pores; few distinct pressure faces; strongly effervescent; slightly alkaline; gradual wavy boundary.
- Bw4—54 to 80 inches; reddish brown (5YR 5/3) clay, reddish brown (5YR 4/3) moist; moderate medium angular blocky structure; very hard, very firm; few very fine roots and pores; few distinct pressure faces; strongly effervescent; slightly alkaline.

The solum is 60 to about 80 inches thick. The clay content of the particle-size control section ranges from 40 to 60 percent. The soil is slightly or strongly effervescent throughout the profile. Reaction is slightly alkaline or moderately alkaline.

The A horizon is reddish brown, strong brown, brown, or yellowish red.

The Bw horizon is reddish brown, light reddish brown, or yellowish red. It is clay or silty clay. It has none to common pressure faces and small slickensides.

Lexton Series

The Lexton series consists of very deep, gently sloping to strongly sloping, well drained, moderately slowly permeable soils on uplands. These soils formed in marine sediments that contain glauconite. Slopes range from 3 to 12 percent. The soils are classified as fine, mixed, active, thermic Udic Haplustalfs.

Typical pedon of Lexton clay loam, 3 to 5 percent slopes; from the intersection of Texas Highway 6 and Farm Road 2549 south of Hearne, 0.8 mile northeast on Farm Road 2549, about 1.6 miles north and east on County Road 256, about 500 feet southeast on a pipeline right-of-way, in rangeland:

- A—0 to 6 inches; reddish brown (5YR 4/3) clay loam, dark reddish brown (5YR 3/3) moist; moderate fine subangular blocky structure; hard, friable; many fine and medium and few coarse roots; slightly acid; clear smooth boundary.
- Bt1—6 to 11 inches; yellowish red (5YR 4/6) clay, yellowish red (5YR 4/6) moist; moderate fine subangular blocky structure; hard, friable; common fine and few medium roots; common distinct clay films on faces of peds; about 1 percent rounded siliceous and ironstone pebbles; slightly acid; clear smooth boundary.
- Bt2—11 to 20 inches; red (2.5YR 4/6) clay, red (2.5YR 4/6) moist; moderate medium subangular blocky structure; hard, firm; few fine and medium roots; many distinct clay films; strongly acid; gradual smooth boundary.
- Bt3—20 to 31 inches; red (2.5YR 5/8) clay, red (2.5YR 4/8) moist; moderate fine angular blocky structure; hard, firm; few fine roots; many distinct clay films; strongly acid; gradual wavy boundary.
- Bt4—31 to 47 inches; yellowish red (5YR 5/6) clay, yellowish red (5YR 4/6) moist; moderate fine angular blocky structure; hard, firm; few fine roots; common distinct clay films; few fine iron manganese concretions; few fine distinct light olive brown (2.5Y 5/6) masses of iron accumulation; moderately acid; clear smooth boundary.
- BCt—47 to 55 inches; strong brown (7.5YR 5/6) clay, strong brown (7.5YR 4/6) moist; weak medium angular blocky structure; hard, firm; few fine roots; few fine distinct red (2.5YR 4/6) and few fine faint olive yellow (5Y 6/8) masses of iron accumulation; slightly acid; clear smooth boundary.
- C—55 to 64 inches; pale brown (2.5Y 8/2) shale with fragments of partially weathered glauconite; massive; common coarse prominent yellowish brown (10YR 5/8) masses of iron accumulation; slightly alkaline; abrupt wavy boundary.
- 2C—64 to 80 inches; very pale brown (10YR 8/2) fine sand, light gray (10YR 7/2) moist; single grain; slightly alkaline.

The solum is 40 to 60 inches thick. The content of ironstone pebbles or fragments ranges from 0 to about 5 percent throughout the solum.

The A horizon is dark reddish brown, reddish brown, or red. Reaction ranges from moderately acid to neutral.

The Bt horizon is red, dark red, reddish brown, dark reddish brown, or yellowish red. In some pedons the lower part of the horizon has none to common redoximorphic concentrations in shades of brown or yellow. Texture is clay loam or clay. The clay content of the particle-size control section ranges from 40 to 55 percent. Reaction ranges from strongly acid to slightly acid.

The BCt horizon is red, reddish brown, yellowish red, or strong brown. Texture is clay loam or clay. The horizon has none to many redoximorphic concentrations in shades of red, brown, or yellow. Reaction is moderately acid or slightly acid.

The C horizon is in shades of brown, yellow, or olive. It ranges from weathered glauconitic material interbedded with shale to clay loam or sandy loam materials. Some pedons contain marine shell fragments. Reaction ranges from moderately acid to slightly alkaline.

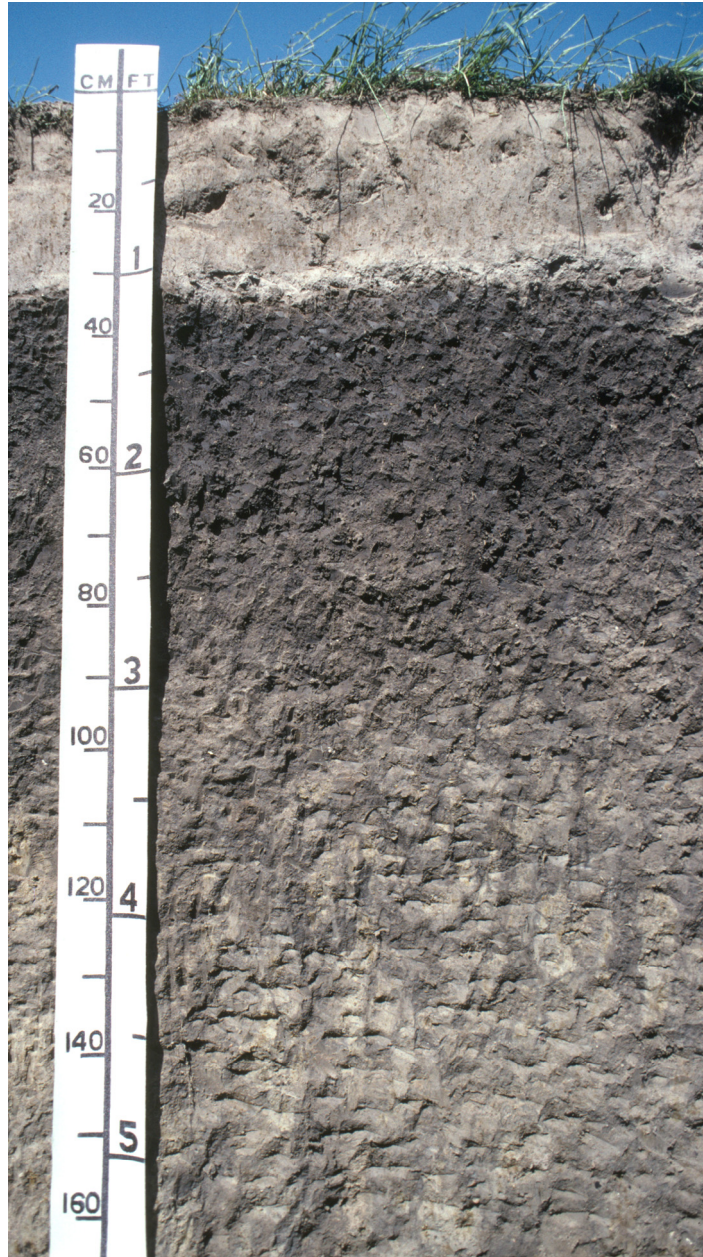


Figure 22.—Profile of Lufkin loam. Texture and color change between the surface layer and the clay subsoil.

The 2C horizon is very pale brown fine sand. Reaction is slightly alkaline or moderately alkaline. Some pedons do not have a 2C horizon.

Lufkin Series

The Lufkin series consists of very deep, nearly level, moderately well drained, very slowly permeable soils on stream terraces. These soils formed in slightly acid to alkaline clayey sediments. Slopes are 0 to 1 percent. The soils are classified as fine, smectitic, thermic Oxyaquic Vertic Paleustalfs.

Typical pedon of Lufkin loam, 0 to 1 percent slopes (fig. 22); from the intersection of

Soil Survey of Robertson County, Texas

U.S. Highway 79 and Farm Road 46 in Franklin, 5.8 miles south on Farm Road 46, about 2.1 miles east on County Road 323, about 1.2 miles south on County Road 314, about 30 feet west in rangeland:

- A—0 to 4 inches; light brownish gray (10YR 6/2) loam, grayish brown (10YR 5/2) moist; weak fine subangular blocky structure; hard, friable; common fine and medium roots; few fine faint yellowish brown (10YR 5/6) masses of iron accumulation; strongly acid; clear wavy boundary.
- E—4 to 9 inches; light gray (10YR 7/2) loam, light brownish gray (10YR 6/2) moist; moderate fine subangular blocky structure; hard, friable; common fine and medium roots; few fine faint brownish yellow (10YR 6/6) masses of iron accumulation; strongly acid; abrupt wavy boundary.
- Btg—9 to 18 inches; light brownish gray (10YR 6/2) clay loam, dark grayish brown (10YR 4/2) moist; moderate coarse angular blocky structure; extremely hard, very firm; common fine and few medium roots; many distinct pressure faces; few distinct clay films on faces of peds; common medium faint brown (10YR 5/3) masses of iron accumulation; very strongly acid; gradual wavy boundary.
- Btssg1—18 to 33 inches; light brownish gray (10YR 6/2) clay, dark grayish brown (10YR 4/2) moist; moderate coarse angular blocky structure; extremely hard, very firm; common fine and few medium roots; many distinct pressure faces; few distinct slickensides; many distinct clay films on faces of peds; common fine faint brown (10YR 5/3) masses of iron accumulation; very strongly acid; gradual wavy boundary.
- Btssg2—33 to 46 inches; light brownish gray (10YR 6/2) clay, dark grayish brown (10YR 4/2) moist; moderate coarse angular blocky structure; extremely hard, very firm; common fine roots; many distinct pressure faces; common distinct slickensides; many distinct clay films on faces of peds; slightly acid; clear wavy boundary.
- Btssg3—46 to 59 inches; light brownish gray (10YR 6/2) clay, grayish brown (10YR 5/2) moist; moderate medium angular blocky structure; extremely hard, very firm; few fine roots; common distinct pressure faces; few distinct slickensides; common distinct clay films on faces of peds; common fine and medium faint dark grayish brown (10YR 4/2) iron depletions and common fine distinct yellowish brown (10YR 5/6) masses of iron accumulation; moderately acid; gradual wavy boundary.
- Btssg4—59 to 67 inches; light brownish gray (2.5Y 6/2) clay, grayish brown (2.5Y 5/2) moist; moderate medium angular blocky structure; extremely hard, very firm; few fine roots; common distinct pressure faces; few distinct slickensides; common distinct clay films on faces of peds; common fine faint light brownish gray (10YR 6/2) and few fine distinct dark grayish brown (10YR 4/2) iron depletions; common fine distinct yellowish brown (10YR 5/6) masses of iron accumulation; moderately acid; gradual wavy boundary.
- Btssg5—67 to 80 inches; light gray (10YR 7/2) clay, light brownish gray (10YR 6/2) moist; weak medium angular blocky structure; extremely hard, very firm; few fine roots; few distinct pressure faces; few distinct slickensides; few distinct clay films on faces of peds; common fine distinct yellowish brown (10YR 5/6) masses of iron accumulation and common fine distinct dark grayish brown (10YR 4/2) iron depletions; moderately acid.

The solum is 60 to more than 80 inches thick. The content of slickensides and pressure faces is few or common throughout the argillic horizon.

The A horizon is very dark gray, dark gray, gray, dark grayish brown, grayish brown, or light brownish gray. The E horizon is gray, light brownish gray, or light gray. The horizon has none to common redoximorphic concentrations in shades of brown and yellow. It is massive and hard when dry but has weak granular structure when moist.

Reaction ranges from strongly acid to slightly acid. The combined thickness of the A and E horizons averages less than 10 inches; however, it can be as much as 15 inches in subsoil troughs. Some pedons do not have an E horizon.

The Btg horizon is dark gray, gray, dark grayish brown, grayish brown, or light brownish gray. Texture is clay or clay loam. The soil has few or common redoximorphic concentrations in shades of brown, olive, or yellow. The clay content of the particle-size control section ranges from 35 to 45 percent. Reaction is strongly acid or very strongly acid.

The Btssg horizon is dark gray, gray, light gray, dark grayish brown, grayish brown, or light brownish gray. Texture is sandy clay loam, clay loam, or clay. The horizon has few or common redoximorphic features in shades of brown, olive, or yellow. Reaction ranges from moderately acid to slightly alkaline.

Luling Series

The Luling series consists of very deep, very gently sloping or gently sloping, well drained, very slowly permeable soils on uplands. These soils formed in weathered shale of the Cook Mountain Formation. Slopes range from 1 to 5 percent. The soils are classified as fine, smectitic, thermic Udic Haplusterts.

Typical pedon of Luling clay, 1 to 3 percent slopes; from the intersection of Farm Road 46 and Old San Antonio Road south of Wheelock, 2.5 miles northeast on Old San Antonio Road, 1.1 miles north on County Road 315, about 250 feet east in rangeland:

- A—0 to 13 inches; grayish brown (10YR 5/2) clay, dark grayish brown (10YR 4/2) moist; moderate medium angular blocky structure; very hard, very firm; very sticky, very plastic; common fine roots; neutral; gradual smooth boundary.
- Bss1—13 to 27 inches; dark grayish brown (10YR 4/2) clay, very dark grayish brown (10YR 3/2) moist; moderate coarse angular blocky structure; very hard, very firm; very sticky, very plastic; common fine roots; common fine pores; few distinct slickensides; neutral; gradual smooth boundary.
- Bss2—27 to 35 inches; dark grayish brown (2.5Y 4/2) clay, very dark grayish brown (2.5Y 3/2) moist; moderate coarse angular blocky structure; extremely hard, very firm; very sticky, very plastic; few fine roots; few fine pores; common distinct slickensides; slightly alkaline; gradual smooth boundary.
- Bss3—35 to 43 inches; grayish brown (2.5Y 5/2) clay, dark grayish brown (2.5Y 4/2) moist; moderate coarse angular blocky structure; extremely hard, very firm; very sticky, very plastic; few fine roots; few fine pores; common distinct slickensides; slightly alkaline; gradual smooth boundary.
- Bss4—43 to 52 inches; light olive brown (2.5Y 5/3) clay, olive brown (2.5Y 4/3) moist; weak medium angular blocky structure; extremely hard, very firm; very sticky, very plastic; few very fine roots and pores; common distinct slickensides; slightly alkaline; gradual smooth boundary.
- BCky—52 to 64 inches; light yellowish brown (2.5Y 6/4) clay, light olive brown (2.5Y 5/4) moist; thin strata of weakly cemented shale; weak medium angular blocky structure; very hard, very firm; very sticky, very plastic; common fine and medium calcium sulfate crystals; common medium calcium carbonate concretions; few fine distinct yellowish brown (10YR 5/6) masses of iron accumulation; slightly alkaline; gradual smooth boundary.
- Cy—64 to 80 inches; light yellowish brown (2.5Y 6/4) soft shale, light olive brown (2.5Y 5/4) moist; massive; very hard, very firm; common fine calcium sulfate crystals; common medium distinct yellowish brown (10YR 5/6) masses of iron accumulation; slightly alkaline.

The solum is 60 to 80 inches thick. The clay content of the particle-size control section ranges from 40 to 55 percent. Undisturbed areas have gilgai microrelief with microknolls 6 to 12 inches higher than the microdepressions. When dry, the soil has cracks as much as 2 inches wide that extend to a depth of more than 40 inches. Slickensides are at a depth of 12 to 24 inches and extend throughout the solum. Reaction ranges from neutral to moderately alkaline.

The A horizon is grayish brown, dark grayish brown, or dark brown.

The Bss horizon is grayish brown, dark grayish brown, olive brown, or light olive brown. Texture is clay. The horizon has none to common redoximorphic concentrations in shades of brown, yellow, or olive. It has none to common concretions and masses of calcium carbonate.

The BCky horizon is mainly clay in shades of gray, brown, or olive with few fragments of weakly cemented shale. It has none to common redoximorphic features in shades of brown, yellow, and gray. It has few or common crystals and masses of calcium sulfate. The content of masses and concretions of calcium carbonate ranges from none to common.

The Cy horizon is weathered shale or clay in shades of gray, brown, yellow, or olive. Some pedons contain shale or clay with thin strata of weakly cemented sandstone. The horizon has few or common crystals and masses of calcium sulfate.

Margie Series

The Margie series consists of very deep, very gently sloping, well drained, moderately slowly permeable soils on uplands. These soils formed in marine sediments that contain glauconite. Slopes range from 1 to 3 percent. The soils are classified as fine, mixed, semiactive, thermic Udic Haplustalfs.

Typical pedon of Margie fine sandy loam, 1 to 3 percent slopes; from the intersection of U.S. Highway 79 and Farm Road 1940 in New Baden, 7.8 miles southeast on Farm Road 1940, about 0.3 mile west on County Road 336, about 700 feet west in improved pasture:

- Ap—0 to 6 inches; strong brown (7.5YR 4/6) fine sandy loam; strong brown (7.5YR 4/6) moist; weak medium subangular blocky structure parting to weak fine granular; slightly hard, friable; common fine roots; moderately acid; clear wavy boundary.
- Bt1—6 to 10 inches; yellowish red (5YR 4/6) sandy clay loam, yellowish red (5YR 4/6) moist; weak medium subangular blocky structure; hard, friable; common fine roots; few distinct clay films on faces of peds; few fine iron-manganese concretions; slightly acid; gradual wavy boundary.
- Bt2—10 to 28 inches; red (2.5YR 4/6) clay loam, dark red (2.5YR 3/6) moist; moderate medium subangular blocky structure; very hard, firm; common fine roots; common distinct clay films on faces of peds; few fine iron-manganese concretions; about 1 percent rounded ironstone pebbles; common medium faint red (2.5YR 4/8) masses of iron accumulation; neutral; gradual wavy boundary.
- Bt3—28 to 46 inches; yellowish red (5YR 4/6) clay, yellowish red (5YR 4/6) moist; moderate medium subangular blocky structure; very hard, firm; few fine roots; common distinct clay films on faces of peds; about 1 percent rounded ironstone pebbles; common fine and medium distinct red (2.5YR 4/6) masses of iron accumulation; slightly acid; gradual wavy boundary.
- Bt4—46 to 66 inches; yellowish red (5YR 5/8) clay, yellowish red (5YR 5/8) moist; moderate medium subangular blocky structure; very hard, firm; few fine roots; common distinct clay films on faces of peds; common fine iron-manganese concretions; about 1 percent rounded ironstone pebbles; common medium distinct

dark red (2.5YR 3/6) masses of iron accumulation; slightly acid; gradual wavy boundary.

BCt—66 to 72 inches; yellowish brown (10YR 5/6) clay loam, dark yellowish brown (10YR 4/6) moist; weak medium subangular blocky structure; very hard, firm; few fine roots; few distinct clay films on faces of peds; about 1 percent rounded ironstone pebbles; about 15 percent brown (10YR 4/3) partially weathered glauconitic material; few fine faint brownish yellow (10YR 6/8) and few fine distinct reddish brown (5YR 4/4) masses of iron accumulation; slightly acid; gradual wavy boundary.

C—72 to 80 inches; stratified yellowish brown (10YR 5/6) weakly cemented sandstone, brown (10YR 4/3) partially weathered glauconite, and dark reddish brown (2.5YR 3/4) shale; massive; very hard, firm; about 2 percent rounded ironstone pebbles; few marine shell fossils; neutral.

The solum is 60 to 80 inches thick. The clay content of the particle-size control section ranges from 35 to 50 percent. The content of rounded ironstone pebbles ranges from 1 to 10 percent throughout the profile.

The A horizon is brown, strong brown, dark brown, or dark reddish brown. Reaction ranges from moderately acid to neutral.

The upper part of the Bt horizon is yellowish red, reddish brown, dark reddish brown, or red. Texture is sandy clay loam. Reaction ranges from moderately acid to neutral.

The lower part of the Bt horizon is dark red, red, dark reddish brown, reddish brown, or yellowish red. Texture is clay loam or clay. The lower part of the horizon has none to common redoximorphic features in shades of brown or yellow. Reaction ranges from strongly acid to neutral.

The BCt horizon is dark yellowish brown, yellowish red, yellowish brown, or brownish yellow. Texture is sandy clay loam or clay loam with fragments of weakly cemented sandstone and partially weathered glauconite. The horizon has few to many redoximorphic features in shades of yellow, brown, or red. Reaction is moderately acid or slightly acid.

The C horizon is in shades of yellow, brown, olive, or gray. It is interbedded with partially weathered glauconite, weakly cemented sandstone, shale, loam, or clay loam. The horizon has none to common marine shell fossils. Reaction ranges from strongly acid to slightly alkaline.

Navasota Series

The Navasota series consists of very deep, nearly level, somewhat poorly drained, very slowly permeable soils on flood plains and tributaries of the Navasota River. These soils formed in clayey alluvium. Slopes are 0 to 1 percent. The soils are classified as fine, smectitic, thermic Aeric Endoaquerts.

Typical pedon of Navasota clay, 0 to 1 percent slopes, frequently flooded; from the intersection of U.S. Highway 79 and Farm Road 2096 in Easterly, 1.5 miles east on Highway 79, about 4.1 miles southeast on County Road 355, about 2.5 miles northeast on a private road and an electric transmission line right-of-way, 50 feet north of the electric transmission line right-of-way, in rangeland:

A—0 to 7 inches; gray (10YR 6/1) clay, dark gray (10YR 4/1) moist; moderate fine subangular blocky structure; extremely hard, very firm; very sticky, very plastic; many fine roots; common fine iron-manganese concretions; many fine distinct strong brown (7.5YR 5/8) masses of iron accumulation; common medium faint gray (10YR 5/1) iron depletions; moderately acid; abrupt wavy boundary.

Bg—7 to 18 inches; light brownish gray (10YR 6/2) clay, grayish brown (10YR 5/2)

moist; moderate medium angular blocky structure; extremely hard, very firm; very sticky, very plastic; common fine roots; common fine iron-manganese concretions; many distinct pressure faces; common fine and medium distinct yellowish brown (10YR 5/6) and few fine distinct strong brown (7.5YR 5/8) masses of iron accumulation; moderately acid; gradual wavy boundary.

Bssg1—18 to 29 inches; light brownish gray (10YR 6/2) clay, grayish brown (10YR 5/2) moist; moderate medium angular blocky structure; extremely hard, very firm; very sticky, very plastic; few fine roots; few distinct slickensides; many distinct pressure faces; common fine iron-manganese concretions; few fine distinct strong brown (7.5YR 5/8) masses of iron accumulation; moderately acid; clear smooth boundary.

Bssg2—29 to 42 inches; light brownish gray (10YR 6/2) clay, grayish brown (10YR 5/2) moist; moderate medium and coarse angular blocky structure; extremely hard, very firm; very sticky, very plastic; common distinct slickensides; many distinct pressure faces; common fine iron-manganese concretions; common medium faint dark grayish brown (10YR 4/2) iron depletions; few fine distinct strong brown (7.5YR 5/8) masses of iron accumulation; moderately acid; gradual wavy boundary.

Bssg3—42 to 47 inches; light brownish gray (10YR 6/2) clay, dark grayish brown (10YR 4/2) moist; weak medium angular blocky structure; extremely hard, very firm; very sticky, very plastic; few distinct slickensides; common distinct pressure faces; common fine iron-manganese concretions; common fine streaks of calcium sulfate crystals or neutral salts; common fine faint gray (10YR 5/1) iron depletions; moderately acid; gradual wavy boundary.

Bssg4—47 to 69 inches; light brownish gray (10YR 6/2) clay, dark grayish brown (10YR 4/2) moist; weak medium angular blocky structure; extremely hard, firm; very sticky, very plastic; few distinct slickensides; common distinct pressure faces; common fine iron-manganese concretions; common fine distinct strong brown (7.5YR 5/8) masses of iron accumulation; few fine and medium distinct gray (10YR 5/1) iron depletions; moderately acid; gradual wavy boundary.

BCg—69 to 80 inches; light brownish gray (10YR 6/2) clay, grayish brown (10YR 5/2) moist; weak medium angular blocky structure; extremely hard, firm; very sticky, very plastic; few distinct slickensides; common distinct pressure faces; common fine iron-manganese concretions; common fine distinct brown (7.5YR 4/4) masses of iron accumulation; common fine faint gray (10YR 5/1) iron depletions; moderately acid.

The solum is more than 80 inches thick. The clay content of the particle-size control section ranges from 40 to 60 percent. The content of iron-manganese concretions and masses is few or common in most pedons. The soil is a cyclic soil, and undisturbed areas have gilgai microrelief with microknolls about 4 to 10 inches higher than microdepressions. When dry, the soil has cracks that open and close periodically. The cracks remain open for less than 90 cumulative days in most years. The soil is saturated and reduced and has redoximorphic features in one or more subhorizons within a depth of 20 inches for extended periods during most years. Slickensides begin at a depth of 10 to 24 inches and extend throughout the solum.

The A horizon is dark gray, gray, dark grayish brown, or grayish brown. It has few or common redoximorphic features in shades of brown or yellow. Reaction ranges from moderately acid to neutral.

The Bg horizon is dark gray, gray, grayish brown, dark grayish brown, or light brownish gray. Texture is clay or silty clay. The horizon has few to many redoximorphic features in shades of brown, gray, or yellow. Reaction ranges from strongly acid to slightly acid.

The Bssg horizon is dark gray, gray, grayish brown, dark grayish brown, or light brownish gray. Texture is clay or silty clay. The horizon has few to many redoximorphic

features in shades of gray, brown, or yellow. The content of calcium sulfate crystals ranges from none to common. Reaction ranges from very strongly acid to slightly acid.

The BCg horizon is sandy clay, clay, or silty clay and has a matrix in shades of gray or brown. It has few to many redoximorphic features in shades of gray, brown, yellow, or red. The content of calcium sulfate crystals ranges from none to common. The content of calcium carbonate concretions is none or few. Reaction ranges from very strongly acid to slightly alkaline.

Oletha Series

The Oletha series consists of very deep, nearly level, somewhat poorly drained, moderately slowly permeable soils on flood plains. These soils formed in clayey and loamy alluvium. Slopes are 0 to 1 percent. The soils are classified as fine-loamy, siliceous, superactive, thermic Aquic Haplustepts.

Typical pedon of Oletha clay, 0 to 1 percent slopes, frequently flooded; from the intersection of U.S. Highway 79 and Farm Road 1940 in New Baden, 9.0 miles southeast on Farm Road 1940, about 1.7 miles east on County Road 334, about 1.2 miles southeast along the fence line, 2,800 feet east-southeast along the fence line, 450 feet north in rangeland:

- A—0 to 6 inches; dark gray (10YR 4/1) clay, very dark gray (10YR 3/1) moist; moderate medium subangular blocky structure; extremely hard, very firm; common fine roots; common fine pores; strongly acid; abrupt wavy boundary.
- Ab—6 to 14 inches; grayish brown (10YR 5/2) sandy clay loam, dark grayish brown (10YR 4/2) moist; weak medium subangular blocky structure; very hard, firm; common fine roots; common fine pores; few fine iron-manganese concretions; few fine distinct dark yellowish brown (10YR 3/6) masses of iron accumulation; strongly acid; clear smooth boundary.
- Bgb1—14 to 26 inches; grayish brown (10YR 5/2) sandy clay loam, dark grayish brown (10YR 4/2) moist; weak coarse prismatic structure; very hard, firm; common fine roots; common fine pores; common fine distinct strong brown (7.5YR 5/8) and few fine distinct strong brown (7.5YR 4/6) masses of iron accumulation; strongly acid; clear smooth boundary.
- Bgb2—26 to 39 inches; grayish brown (10YR 5/2) sandy clay loam, dark grayish brown (10YR 4/2) moist; weak coarse prismatic structure; very hard, firm; common fine roots; common fine pores; few fine iron-manganese concretions; common fine distinct yellowish brown (10YR 5/6) masses of iron accumulation; strongly acid; clear smooth boundary.
- Ab'—39 to 50 inches; gray (10YR 5/1) sandy clay loam, dark gray (10YR 4/1) moist; weak medium subangular blocky structure; very hard, firm; few fine roots; common fine pores; common medium faint grayish brown (10YR 5/2) iron depletions; few fine distinct yellowish brown (10YR 5/6) masses of iron accumulation; strongly acid; clear smooth boundary.
- Bgb'1—50 to 61 inches; gray (10YR 6/1) sandy clay loam, gray (10YR 5/1) moist; weak coarse prismatic structure; very hard, firm; few fine roots; common medium distinct yellowish brown (10YR 5/8) masses of iron accumulation; strongly acid; gradual smooth boundary.
- Bgb'2—61 to 72 inches; gray (10YR 6/1) sandy clay loam, gray (10YR 5/1) moist; weak coarse prismatic structure; very hard, firm; common medium distinct yellowish brown (10YR 5/6) masses of iron accumulation; common medium faint dark gray (10YR 4/1) iron depletions; strongly acid; clear smooth boundary.
- BCgb—72 to 80 inches; light brownish gray (10YR 6/2) fine sandy loam, grayish brown (10YR 5/2) moist; weak coarse prismatic structure; very hard, firm; common

coarse distinct yellowish brown (10YR 5/8) masses of iron accumulation; few medium faint gray (10YR 5/1) iron depletions; slightly acid.

The solum is 60 to more than 80 inches thick. The clay content of the particle-size control section ranges from 24 to 35 percent.

The A horizon is very dark gray, dark gray, or very dark grayish brown. It has none or few redoximorphic features in shades of brown or yellow. Reaction ranges from strongly acid to neutral.

The Ab and Ab' horizons are dark gray, gray, very dark grayish brown, or grayish brown. They are sandy clay loam or clay loam. They have none or few redoximorphic features in shades of brown. Reaction ranges from strongly acid to neutral.

The Bgb and Bgb' horizons are dark gray, gray, dark grayish brown, grayish brown, or light brownish gray. They are loam, sandy clay loam, or clay loam. They have none or few redoximorphic features in shades of brown and gray. Reaction ranges from strongly acid to moderately alkaline.

The BCgb horizon is gray, grayish brown, or light brownish gray. Texture is fine sandy loam or sandy clay loam. The horizon has none or few redoximorphic features in shades of brown and gray. Reaction ranges from slightly acid to moderately alkaline.

Padina Series

The Padina series consists of very deep, very gently sloping to moderately steep, well drained, moderately permeable soils on uplands. These soils formed in thick sandy materials. Slopes range from 1 to 15 percent. The soils are classified as loamy, siliceous, active thermic Grossarenic Paleustalfs.

Typical pedon of Padina loamy fine sand, 1 to 5 percent slopes; from the intersection of U.S. Highway 79 and Farm Road 46 in Franklin, 4.0 miles north on Farm Road 46, about 13.0 miles northeast on Farm Road 979, about 1.6 miles north on County Road 468, about 0.8 mile north on a private road, 50 feet northeast in rangeland:

- A—0 to 5 inches; brown (10YR 5/3) loamy fine sand, brown (10YR 4/3) moist; weak fine and medium granular structure; loose, very friable; common fine and few medium roots; neutral; clear smooth boundary.
- E—5 to 56 inches; very pale brown (10YR 7/3) loamy fine sand, pale brown (10YR 6/3) moist; weak fine granular structure; loose, very friable; few fine and medium roots; slightly acid; abrupt wavy boundary.
- Bt1—56 to 61 inches; light brownish gray (10YR 6/2) sandy clay loam; grayish brown (10YR 5/2) moist; weak medium subangular blocky structure; hard, friable; few distinct clay films on faces of peds; many medium prominent reddish yellow (7.5YR 6/8) masses of iron accumulation; strongly acid; clear smooth boundary.
- Bt2—61 to 74 inches; light gray (10YR 7/1) sandy clay loam, gray (10YR 6/1) moist; moderate medium subangular blocky structure; very hard, firm; few distinct clay films on faces of peds; many medium prominent red (2.5YR 5/8) and many medium distinct yellowish brown (10R 5/8) masses of iron accumulation; strongly acid; gradual wavy boundary.
- Bt3—74 to 80 inches; light gray (10YR 7/1) fine sandy loam, gray (10YR 6/1) moist; weak medium subangular blocky structure; slightly hard, friable; few faint clay films on faces of peds; common medium prominent red (2.5YR 5/8) masses of iron accumulation; strongly acid.

The solum is 65 to more than 80 inches thick. The combined A and E horizons range from 40 to 80 inches in thickness.

The A horizon is grayish brown, brown, pale brown, yellowish brown, or light yellowish brown. Reaction ranges from moderately acid to neutral.

The E horizon is pale brown, very pale brown, or light yellowish brown. Texture is loamy fine sand or fine sand. Reaction ranges from moderately acid to neutral.

The Bt horizon is gray, light gray, grayish brown, light brownish gray, brownish yellow, yellowish brown, or yellowish red. Texture is fine sandy loam or sandy clay loam. The horizon has few to many redoximorphic features in shades of red, yellow, brown, and gray. Some pedons have a mottled matrix of these colors. The clay content of the particle-size control section ranges from 18 to 35 percent. Reaction ranges from strongly acid to slightly acid.

Rader Series

The Rader series consists of very deep, nearly level, moderately well drained, very slowly permeable soils on terraces and terrace remnants on uplands. These soils formed in loamy and clayey sediments. Slopes range from 0 to 2 percent. The soils are classified as fine-loamy, mixed, semiactive, thermic Aquic Paleustalfs.

Typical pedon of Rader fine sandy loam, 0 to 2 percent slopes (fig. 23); from the intersection of U.S. Highway 79 and Farm Road 46 in Franklin, 4.0 miles north on Farm Road 46, about 13.0 miles northeast on Farm Road 979, about 1.5 miles north on County Road 468, about 100 feet west in cropland:

Ap—0 to 8 inches; yellowish brown (10YR 5/4) fine sandy loam, dark yellowish brown (10YR 4/4) moist; weak fine to medium subangular blocky structure; slightly hard, very friable; many fine and medium roots; slightly acid; abrupt smooth boundary.

A—8 to 14 inches; dark yellowish brown (10YR 4/4) fine sandy loam, brown (10YR 4/3) moist; weak medium subangular blocky structure; slightly hard, very friable; common fine roots; slightly acid; clear smooth boundary.

E—14 to 21 inches; very pale brown (10YR 7/3) fine sandy loam, pale brown (10YR 6/3) moist; weak fine granular structure; slightly hard, very friable; few fine roots; few fine faint yellowish brown (10YR 5/6) masses of iron accumulation; slightly acid; gradual wavy boundary.

Bt/E—21 to 24 inches; light yellowish brown (10YR 6/4) loam (Bt part), yellowish brown (10YR 5/4) moist; 20 percent of horizon is pockets of very pale brown (10YR 7/3) fine sandy loam (E part); weak medium subangular blocky structure; slightly hard, very friable; few fine roots; few faint clay films on faces of peds; common medium prominent brownish yellow (10YR 6/8) and reddish yellow (7.5YR 6/8) masses of iron accumulation (Bt part); slightly acid; gradual wavy boundary.

Bt1—24 to 33 inches; light brownish gray (10YR 6/2) clay loam, grayish brown (10YR 5/2) moist; moderate medium subangular blocky structure; hard, friable; few fine roots; few fine pores; common distinct clay films on faces of peds; common medium and coarse prominent reddish yellow (7.5YR 6/8) and few medium prominent red (2.5YR 5/8) masses of iron accumulation; strongly acid; gradual wavy boundary.

Bt2—33 to 49 inches; light brownish gray (10YR 6/2) clay loam, grayish brown (10YR 5/2) moist; moderate medium subangular blocky structure; very hard, firm; few fine roots; few fine pores; common distinct clay films on faces of peds; many medium and coarse prominent reddish yellow (7.5YR 6/8) and red (2.5YR 5/8) masses of iron accumulation; strongly acid; gradual wavy boundary.

Bt3—49 to 65 inches; distinctly mottled gray (10YR 6/1) and brownish yellow (10YR 6/8) clay; moderate medium angular blocky structure; extremely hard, very firm; few very fine roots; few fine pores; common distinct clay films on faces of peds; common medium prominent red (2.5YR 4/6) masses of iron accumulation; neutral; gradual wavy boundary.

BCt—65 to 80 inches; gray (10YR 6/1) clay, gray (10YR 5/1) moist; moderate medium



Figure 23.—Profile of Rader fine sandy loam. Reddish iron accumulations are at a depth of about 21 inches.

angular blocky structure; extremely hard, very firm; few faint clay films on faces of peds; many coarse prominent yellowish red (5YR 5/6) masses of iron accumulation; moderately alkaline.

The solum is 60 to more than 80 inches thick. The clay content of the particle-size control section ranges from 28 to 35 percent.

The A horizon is dark grayish brown, dark yellowish brown, brown, grayish brown, pale brown, or yellowish brown. The E horizon is light brownish gray, pale brown, light yellowish brown, very pale brown, or light gray. The lower part of the E horizon has

none or few redoximorphic features in shades of brown or yellow. Reaction ranges from strongly acid to slightly acid. The combined thickness of the A and E horizons ranges from 12 to 22 inches.

The Bt/E horizon is 75 to 80 percent Bt material. The Bt part is yellowish brown, brownish yellow, or light yellowish brown. It is loam or sandy clay loam. The amount of redoximorphic features in shades of gray, red, brown, or yellow ranges from few to many. The E part is light brownish gray, light gray, pale brown, or very pale brown. It is fine sandy loam or loam. It occurs as coatings on faces of peds and pockets that decrease in amount as depth increases. Reaction ranges from strongly acid to neutral.

The Bt horizon is grayish brown, light brownish gray, gray, light gray, yellowish brown, or brownish yellow. Texture is clay loam or clay. The horizon has few to many redoximorphic features in shades of gray, yellow, brown, or red. Reaction is very strongly acid or strongly acid in the upper part of the Bt horizon and ranges from strongly acid to neutral in the lower part.

The BCt horizon is gray, light brownish gray, light gray, or very pale brown. It is sandy clay loam, sandy clay, or clay. It has few to many redoximorphic features in shades of gray, yellow, brown, or red. It has none or few concretions or soft masses of calcium carbonate. Reaction ranges from strongly acid to moderately alkaline.

Robco Series

The Robco series consists of very deep, very gently sloping, moderately well drained, slowly permeable soils on uplands. These soils formed in loamy sediments. Slopes range from 1 to 3 percent. The soils are classified as loamy, siliceous, active, thermic Aquic Arenic Paleustalfs.

Typical pedon of Robco loamy fine sand, 1 to 3 percent slopes; from the intersection of Farm Road 46 and Farm Road 979 in Owensville, 5.0 miles north and 0.8 mile east on Farm Road 979, about 1.4 miles north on County Road 380, about 0.6 mile east on a private road, 950 feet south in improved pasture:

- Ap—0 to 8 inches; pale brown (10YR 6/3) loamy fine sand, brown (10YR 4/3) moist; weak fine granular structure; soft, very friable; many fine roots; moderately acid; clear smooth boundary.
- A—8 to 16 inches; brown (10YR 5/3) loamy fine sand, brown (10YR 4/3) moist; weak medium granular structure; soft, friable; common fine and medium roots; slightly acid; clear smooth boundary.
- E—16 to 29 inches; very pale brown (10YR 7/3) loamy fine sand, pale brown (10YR 6/3) moist; weak fine granular structure; soft, very friable; common fine roots; moderately acid; gradual wavy boundary.
- Bt/E—29 to 34 inches; light yellowish brown (10YR 6/4) sandy clay loam (Bt part), yellowish brown (10YR 5/4) moist; 30 percent of horizon is tongues of light brownish gray (10YR 6/2) loamy fine sand (E part); weak fine subangular blocky structure; slightly hard, friable; few fine roots; few faint clay films on faces of peds; few iron-manganese nodules; common medium distinct yellowish red (5YR 5/8) and few fine prominent red (2.5YR 5/8) masses of iron accumulation; moderately acid; gradual wavy boundary.
- Btg—34 to 40 inches; light gray (10YR 7/2) sandy clay loam, light brownish gray (10YR 6/2) moist; weak medium and coarse subangular blocky structure; hard, firm; few fine roots; few fine pores; common distinct clay films on faces of peds; common medium distinct yellowish brown (10YR 5/8) masses of iron accumulation; moderately acid; clear smooth boundary.
- Bt—40 to 54 inches; light yellowish brown (2.5Y 6/4) clay, light olive brown (2.5Y 5/4) moist; moderate medium angular blocky structure; hard, firm; few fine roots; few fine pores; common distinct clay films on faces of peds; common medium distinct

yellowish brown (10YR 5/6) masses of iron accumulation; common medium distinct gray (10YR 5/1) iron depletions; moderately acid; clear smooth boundary.

B'tg—54 to 64 inches; light gray (2.5Y 7/2) clay loam, light brownish gray (2.5Y 6/2) moist; moderate medium subangular blocky structure; hard, firm; few distinct clay films on faces of peds; common medium distinct brownish yellow (10YR 6/6) and few fine prominent strong brown (7.5YR 5/8) masses of iron accumulation; moderately acid; gradual smooth boundary.

BCt—64 to 80 inches; light gray (2.5Y 7/2) clay loam, light brownish gray (2.5Y 6/2) moist; moderate medium subangular blocky structure; hard, friable; few distinct clay films on faces of peds; few black stains along ped surfaces; few fine iron manganese nodules; common medium distinct yellowish brown (10YR 5/8) and brown (7.5YR 4/4) masses of iron accumulation; slightly acid.

The solum is 60 to more than 80 inches thick. The clay content of the particle-size control section ranges from 25 to 35 percent.

The combined thickness of the A and E horizons ranges from 20 to 40 inches. The A horizon is brown, pale brown, dark yellowish brown, or yellowish brown. Reaction ranges from strongly acid to slightly acid.

The E horizon is pale brown, very pale brown, yellowish brown, or light yellowish brown. It has none to common redoximorphic features in shades of gray or yellow. Reaction ranges from very strongly acid to moderately acid.

The Bt/E horizon is 60 to 90 percent Bt material. The Bt part is yellowish brown, light yellowish brown, brownish, or yellow. It is loam, sandy clay loam, or clay loam. The E part consists of tongues, interfingers, and pockets that are light brownish gray, light gray, pale brown, or very pale brown fine sand or loamy fine sand. The horizon has few redoximorphic features in shades of gray, yellow, or red and ranges to a mottled matrix of these colors. Reaction ranges from very strongly acid to slightly acid.

The Bt/E, Btg, Bt, and B'tg horizons are grayish brown, brown, pale brown, light yellowish brown, light olive brown, light gray, light brownish gray, or gray. The horizons have few to many redoximorphic features in shades of gray, red, yellow, or brown, or the matrix is mottled in shades of red, gray, and yellow. Texture is loam or sandy clay loam in the upper part of the argillic horizon and clay loam or clay in the lower part. Reaction ranges from very strongly acid to moderately acid.

The BCt horizon is grayish brown, brown, pale brown, light brownish gray, or light gray. Texture is sandy clay loam, clay loam, sandy clay, or clay. The horizon has few to many redoximorphic features in shades of red, yellow, gray, or brown. The content of masses of calcium sulfate crystals and other salts ranges from none to common. Reaction ranges from very strongly acid to neutral.

Roetex Series

The Roetex series consists of very deep, nearly level, somewhat poorly drained, very slowly permeable soils on flood plains of the Brazos River. These soils formed in clayey alluvium. Slopes are 0 to 1 percent. The soils are classified as very fine, mixed, active, thermic Aquic Hapluderts.

Typical pedon of Roetex clay, 0 to 1 percent slopes, frequently flooded; from the intersection of Texas Highway 6 and Farm Road 1373, about 3.0 miles west of Bremond, 6.0 miles west on Farm Road 1373 to a railroad track, 0.35 mile west on a field road, 0.55 mile north on a field road parallel to a drainageway, 100 feet west, in the center of an elongated depression in rangeland:

A1—0 to 12 inches; reddish brown (5YR 4/3) clay, dark reddish brown (5YR 3/3) moist; moderate fine and medium granular structure; very hard, very firm; very sticky, very plastic; common fine roots; strongly effervescent; moderately alkaline; clear smooth boundary.

- A2—12 to 17 inches; reddish brown (5YR 4/3) clay, dark reddish brown (5YR 3/3) moist; moderate fine and medium subangular blocky structure; very hard, very firm; very sticky, very plastic; few fine roots; few prominent pressure faces; few fine faint yellowish red (5YR 5/6) masses of iron accumulation; strongly effervescent; moderately alkaline; clear smooth boundary.
- Bss1—17 to 35 inches; reddish gray (5YR 5/2) clay; dark reddish gray (5YR 4/2) moist; moderate medium angular blocky structure; very hard, very firm; very sticky, very plastic; few fine roots; common distinct slickensides; few vertical cracks filled with reddish brown (5YR 4/3) clay; common medium prominent gray (10YR 5/1) iron depletions; strongly effervescent; moderately alkaline; gradual wavy boundary.
- Bss2—35 to 42 inches; reddish brown (5YR 5/3) clay, reddish brown (5YR 4/3) moist; moderate medium angular blocky structure; extremely hard, very firm; very sticky, very plastic; few fine roots; common distinct slickensides; common medium distinct yellowish red (5YR 5/6) masses of iron accumulation; few fine prominent dark gray (10YR 4/1) iron depletions; strongly effervescent; moderately alkaline; gradual wavy boundary.
- Bss3—42 to 55 inches; brown (7.5YR 4/4) clay, dark brown (7.5YR 3/4) moist; moderate medium angular blocky structure; extremely hard, very firm; very sticky, very plastic; few fine roots; common distinct slickensides; common medium prominent dark gray (10YR 4/1) iron depletions; common medium distinct yellowish red (5YR 4/6) masses of iron accumulation; strongly effervescent; moderately alkaline; gradual wavy boundary.
- BCss—55 to 80 inches; distinctly mottled reddish brown (5YR 5/4) and brown (7.5YR 4/2) clay; massive; very hard, very firm; very sticky, very plastic; few very fine roots; few distinct slickensides; strongly effervescent; moderately alkaline.

The solum is 60 to more than 80 inches thick. The clay content of the particle-size control section ranges from 60 to 72 percent. Undisturbed areas have gilgai microrelief with microknolls a few inches higher than microdepressions. Slickensides begin at a depth of 12 to 24 inches in most pedons and extend throughout the solum. The soil is very slightly effervescent to strongly effervescent, and reaction is slightly alkaline or moderately alkaline.

The A horizon is reddish brown, dark reddish brown, dark reddish gray, or dark brown.

The Bss and BCss horizons are reddish brown, reddish gray, dark reddish gray, dark brown, dark reddish brown, or brown. Texture is silty clay or clay. The horizons have few to many redoximorphic features in shades of gray or red.

Rosanky Series

The Rosanky series consists of very deep, very gently sloping to moderately sloping, well drained, moderately slowly permeable soils on uplands. These soils formed in residuum weathered from weakly cemented sandstone. Slopes range from 2 to 8 percent. The soils are classified as fine, mixed, semiactive, thermic Ultic Paleustalfs.

Typical pedon of Rosanky fine sandy loam, 2 to 5 percent slopes; from the intersection of U.S. Highway 79 and Farm Road 1940 in New Baden, 6.5 miles east on U.S. Highway 79, about 0.1 mile south on County Road 355, about 150 feet west in rangeland:

- A—0 to 7 inches; yellowish brown (10YR 5/4) fine sandy loam, dark yellowish brown (10YR 4/4) moist; weak fine granular structure; slightly hard, friable; common fine roots; about 1 percent ironstone gravel; strongly acid; clear smooth boundary.
- Bt1—7 to 21 inches; red (2.5YR 4/6) clay, dark red (2.5YR 3/6) moist; moderate fine and medium subangular blocky structure; very hard, firm; common fine roots;

- common fine pores; common distinct clay films on faces of peds; few fine faint red (2.5YR 4/8) masses of iron accumulation; strongly acid; clear smooth boundary.
- Bt2—21 to 39 inches; red (2.5YR 4/6) clay, dark red (2.5YR 3/6) moist; moderate fine and medium subangular blocky structure; very hard, firm; common fine pores; common distinct clay films on faces of peds; common fine and medium prominent strong brown (7.5YR 5/6) and few fine faint red (2.5YR 4/8) masses of iron accumulation; strongly acid; gradual smooth boundary.
- BCt—39 to 47 inches; red (2.5YR 5/8) clay loam, red (2.5YR 4/8) moist; weak medium subangular blocky structure; very hard, firm; few fine roots; few distinct clay films on faces of peds; common fine and medium prominent brownish yellow (10YR 6/8) masses of iron accumulation; common light brownish gray (10YR 6/2) shale fragments; strongly acid; clear smooth boundary.
- C1—47 to 64 inches; prominently mottled red (2.5YR 4/8) and light brownish gray (10YR 6/2) clay loam that has thin strata of weakly cemented sandstone; massive; hard, firm; common fine and medium prominent brownish yellow (10YR 6/8) masses of iron accumulation; common flakes of mica; strongly acid; gradual smooth boundary.
- C2—64 to 71 inches; distinctly mottled brownish yellow (10YR 6/6), reddish yellow (7.5YR 6/8), and light gray (10YR 7/2) fine sandy loam; massive; hard, very friable; common fine and medium prominent red (2.5YR 4/8) masses of iron accumulation; common flakes of mica; strongly acid; gradual smooth boundary.
- Cr—71 to 80 inches; stratified brownish yellow (10YR 6/8) weakly cemented sandstone and light brownish gray (10YR 6/2) sandy clay loam; massive; hard, firm; common medium brownish yellow (10YR 6/8) and few fine and medium prominent red (2.5YR 4/6) masses of iron accumulation; few flakes of mica; strongly acid.

The solum is 40 to 60 inches thick. Base saturation ranges from 35 to 75 percent throughout the argillic horizon. The clay content of the particle-size control section ranges from 35 to 50 percent.

The A horizon is dark grayish brown, brown, dark yellowish brown, or yellowish brown. The content of ironstone gravel ranges from less than 1 to 5 percent, by volume. Reaction ranges from strongly acid to slightly acid.

The Bt horizon is red, reddish brown, light red, yellowish red, or reddish yellow. Texture is sandy clay or clay. The horizon has none to common redoximorphic features in shades of red, brown, or yellow. Reaction is strongly acid or moderately acid.

The BCt and C horizons are red, reddish yellow, yellowish red, or brownish yellow. Texture is fine sandy loam, sandy clay loam, or clay loam. In some pedons the horizon has redoximorphic features in shades of red, brown, yellow, or gray and ranges to a mottled matrix. Some pedons contain thin strata of shale or weakly cemented sandstone. Reaction is strongly acid or moderately acid.

The Cr horizon is weakly cemented to moderately cemented sandstone that has thin strata of shale and loamy materials of fine sandy loam or sandy clay loam. The horizon is in shades of brown, red, or gray. Reaction is strongly acid or moderately acid.

Sadow Series

The Sadow series consist of very deep, nearly level, moderately well drained, moderately slowly permeable soils on flood plains. These soils formed in loamy alluvium. Slopes range from 0 to 2 percent. The soils are classified as fine-loamy, siliceous, superactive, thermic Udifluventic Haplustepts.

Typical pedon of Sadow loam, 0 to 2 percent slopes, frequently flooded; from the intersection of Farm Road 1644 and County Road 118 in Calvert, 2.0 miles south and

1.4 miles east on County Road 118, about 0.6 mile south on a private road to a flood plain of Mud Creek, 200 feet south-southeast in rangeland:

- A—0 to 9 inches; brown (10YR 5/3) loam, brown (10YR 4/3) moist; weak fine and medium subangular blocky structure; slightly hard, very friable; few fine roots; common wormcasts; moderately acid; clear smooth boundary.
- Bw—9 to 19 inches; brown (10YR 4/3) clay loam, dark brown (10YR 3/3) moist; moderate medium subangular blocky structure; hard, friable; few fine roots; few fine pores; few fine faint pale brown (10YR 6/3) masses of iron accumulation; slightly acid; clear smooth boundary.
- Bwb1—19 to 26 inches; light yellowish brown (10YR 6/4) sandy clay loam, yellowish brown (10YR 5/4) moist; moderate medium subangular blocky structure; hard, friable; few fine roots; few fine pores; few medium faint brownish yellow (10YR 6/6) masses of iron accumulation; neutral; gradual smooth boundary.
- Bwb2—26 to 38 inches; yellowish brown (10YR 5/4) loam, dark yellowish brown (10YR 4/4) moist; weak medium subangular blocky structure; hard, friable; few fine roots; few fine pores; few fine faint pale brown (10YR 6/3) masses of iron accumulation; neutral; clear smooth boundary.
- Bwb3—38 to 49 inches; pale brown (10YR 6/3) fine sandy loam, brown (10YR 5/3) moist; weak fine subangular blocky structure; slightly hard, very friable; slightly acid; clear smooth boundary.
- Bwb4—49 to 80 inches; light yellowish brown (10YR 6/4) loam, yellowish brown (10YR 5/4) moist; weak medium subangular blocky structure; slightly hard, friable; neutral.

The solum is more than 80 inches thick. The clay content of the particle-size control section ranges from 18 to 25 percent. Some pedons have buried A horizons.

The A horizon is brown, grayish brown, dark grayish brown, or dark gray. Reaction ranges from moderately acid to neutral.

The Bw and Bwb horizons are brown, dark yellowish brown, pale brown, light yellowish brown, or yellowish brown. They have few to many redoximorphic features in shades of brown, gray, yellow, or red. Texture is fine sandy loam, loam, sandy clay loam, or clay loam. Reaction ranges from moderately acid to slightly alkaline.

Ships Series

The Ships series consists of very deep, nearly level to very gently sloping, moderately well drained, very slowly permeable soils on flood plains of the Brazos River. These soils formed in clayey alluvium. Slopes range from 0 to 3 percent. The soils are classified as very fine, mixed, active, thermic Chromic Hapluderts.

Typical pedon of Ships clay, 0 to 1 percent slopes, rarely flooded (fig. 24); from the intersection of Farm Road 485 and Texas Highway 6 north of Hearne, 4.6 miles west on Farm Road 485, about 1.4 miles north on Farm Road 1644, about 1 mile east on a field road, 100 feet south in cropland:

- Ap—0 to 6 inches; dark reddish gray (5YR 4/2) clay, dark reddish brown (5YR 3/2) moist; moderate fine and medium granular structure; very hard, very firm; very sticky, very plastic; common fine roots; common fine pores; strongly effervescent; moderately alkaline; abrupt smooth boundary.
- Bss1—6 to 21 inches; reddish brown (5YR 4/3) clay, dark reddish brown (5YR 3/3) moist; moderate fine and medium subangular blocky structure; very hard, very firm; very sticky, very plastic; few fine roots; common fine pores; few distinct slickensides; few vertical cracks filled with dark reddish brown (5YR 3/2) clay; strongly effervescent; moderately alkaline; gradual wavy boundary.
- Bss2—21 to 35 inches; reddish brown (5YR 5/3) clay, reddish brown (5YR 4/3) moist;



Figure 24.—Profile of Ships clay. Slickensides are at a depth of about 2 feet.

moderate fine angular blocky structure; very hard, very firm; very sticky, very plastic; few fine roots; common fine pores; common distinct slickensides; few vertical cracks filled with dark reddish brown (5YR 3/2) clay; strongly effervescent; moderately alkaline; gradual wavy boundary.

Bkss1—35 to 55 inches; brown (7.5YR 4/4) clay, dark brown (7.5YR 3/4) moist; moderate medium angular blocky structure; extremely hard, very firm; very sticky, very plastic; few fine roots; common fine pores; common distinct slickensides; few fine calcium carbonate concretions; strongly effervescent; moderately alkaline; gradual wavy boundary.

Bkss2—55 to 70 inches; reddish brown (5YR 4/4) clay, dark reddish brown (5YR 3/4) moist; moderate medium angular blocky structure; extremely hard, very firm; very sticky, very plastic; few fine roots; common distinct slickensides; common fine calcium carbonate concretions; strongly effervescent; moderately alkaline; gradual wavy boundary.

BCK—70 to 80 inches; reddish brown (5YR 5/4) clay, dark reddish brown (5YR 3/4) moist; weak medium angular blocky structure; very hard, very firm; very sticky, very plastic; few very fine roots; common fine calcium carbonate concretions; strongly effervescent; moderately alkaline.

The solum is more than 80 inches thick. The clay content of the particle-size control section ranges from 60 to 70 percent. Undisturbed areas have gilgai microrelief with microknolls 2 to 6 inches higher than microdepressions. Slickensides begin at a depth of 12 to 24 inches and extend throughout the solum. Reaction is slightly alkaline or moderately alkaline. Effervescence ranges from very slight to strong. The content of calcium carbonate, in the form of threads, masses, or concretions, ranges from none to common.

The A horizon is reddish brown, dark reddish brown, dark reddish gray, or dark brown.

The Bss, Bkss, and BC horizons are reddish brown, dark reddish brown, or brown. Texture is silty clay or clay.

Silawa Series

The Silawa series consists of very deep, very gently sloping to moderately sloping, well drained, moderately permeable soils on stream terraces. These soils formed in sandy and loamy sediments. Slopes range from 2 to 8 percent. The soils are classified as fine-loamy, siliceous, semiactive, thermic Ultic Haplustalfs.

Typical pedon of Silawa loamy fine sand, 2 to 5 percent slopes (fig. 25); from the intersection of U.S. Highway 79 and Farm Road 46 in Franklin, 5.7 miles south on Farm Road 46, about 1.2 miles west and 0.8 mile north on County Road 325, about 140 feet east in improved pasture:

Ap—0 to 6 inches; yellowish brown (10YR 5/4) loamy fine sand, dark yellowish brown (10YR 4/4) moist; weak fine granular structure; slightly hard, very friable; many fine roots; moderately acid; clear smooth boundary.

E—6 to 15 inches; light yellowish brown (10YR 6/4) loamy fine sand, yellowish brown (10YR 5/4) moist; weak fine granular structure; slightly hard, very friable; many fine roots; strongly acid; clear smooth boundary.

Bt1—15 to 23 inches; red (2.5YR 4/6) sandy clay loam, dark red (2.5YR 3/6) moist; moderate medium subangular blocky structure; very hard, firm; common fine roots; common fine pores; common distinct clay films on faces of peds; few fine distinct strong brown (7.5YR 5/6) masses of iron accumulation; very strongly acid; gradual wavy boundary.

Bt2—23 to 41 inches; red (2.5YR 4/6) sandy clay loam, red (2.5YR 4/6) moist; moderate medium subangular blocky structure; very hard, firm; few fine roots; common fine pores; common distinct clay films on faces of peds; few fine distinct strong brown (7.5YR 5/8) masses of iron accumulation; very strongly acid; clear smooth boundary.

BCt—41 to 57 inches; red (2.5YR 4/8) sandy clay loam, red (2.5YR 4/8) moist; weak fine subangular blocky structure; very hard, firm; few fine roots; few distinct clay films on faces of peds; common medium distinct strong brown (7.5YR 5/8) masses of iron accumulation; very strongly acid; clear smooth boundary.

C—57 to 80 inches; red (2.5YR 5/8) fine sandy loam, red (2.5YR 4/8) moist; massive; slightly hard, very friable; very strongly acid.

The solum is 40 to 60 inches thick. The clay content of the particle-size control section ranges from 18 to 35 percent. The content of siliceous pebbles ranges from 0 to 10 percent throughout the solum. Base saturation ranges from 35 to 70 percent throughout the argillic horizon.

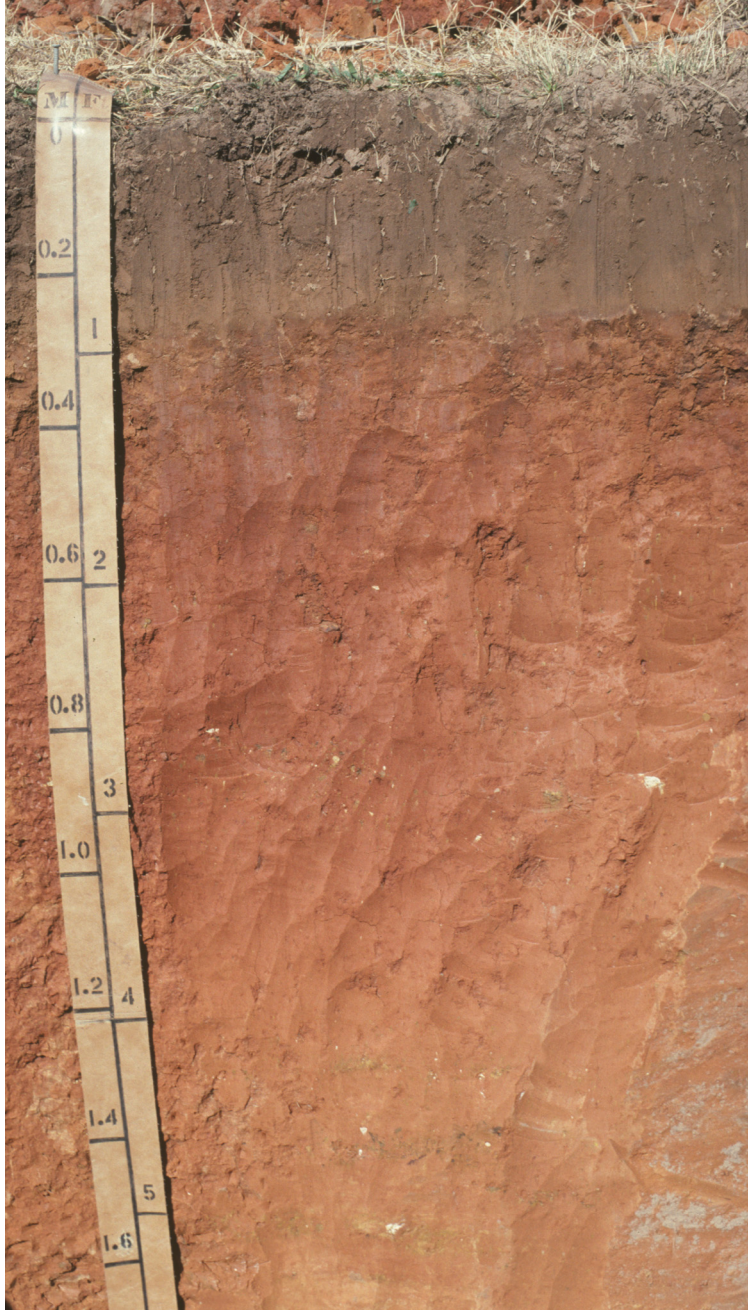


Figure 25.—Profile of Silawa loamy fine sand. The reddish subsoil begins at a depth of about 1 foot.

The Ap horizon is grayish brown, brown, dark grayish brown, yellowish brown, or light yellowish brown. The E horizon is pale brown, very pale brown, light brown, or light yellowish brown. Reaction ranges from strongly acid to slightly acid. The combined thickness of the A and E horizons ranges from 10 to 20 inches.

The Bt horizon is red, reddish brown, light red, yellowish red, reddish yellow, or strong brown. It has none or few redoximorphic features in shades of brown or red. Texture is sandy clay loam or clay loam. Reaction ranges from very strongly acid to moderately acid.

The BCt horizon has colors in shades of red, brown, or yellow. Texture is fine sandy loam or sandy clay loam or their gravelly counterparts. The content of siliceous pebbles ranges from 0 to 35 percent, by volume. Reaction ranges from very strongly acid to moderately acid.

The C horizon is red, reddish brown, light red, yellowish red, reddish yellow, or strong brown. It is loamy sand, loamy fine sand, fine sandy loam, or their gravelly counterparts. Some pedons have thin strata of sand and gravel. Reaction ranges from very strongly acid to slightly acid.

Silstid Series

The Silstid series consists of very deep, very gently sloping to moderately sloping, well drained, moderately permeable soils on uplands. These soils formed in beds of sandy or loamy material and interbedded sandstone. Slopes range from 1 to 8 percent. The soils are classified as loamy, siliceous, semiactive, thermic Arenic Paleustalfs.

Typical pedon of Silstid loamy fine sand, 1 to 3 percent slopes (fig. 26); from the intersection of Texas Highway 14 and Farm Road 2293 in Bremond, 8.0 miles southeast on Farm Road 2293, about 0.9 mile south on County Road 450, about 500 feet west in improved pasture:

- Ap—0 to 6 inches; pale brown (10YR 6/3) loamy fine sand, brown (10YR 4/3) moist; single grain; loose, very friable; common fine roots; slightly acid; clear smooth boundary.
- E—6 to 29 inches; very pale brown (10YR 7/4) loamy fine sand, pale brown (10YR 6/3) moist; single grain; loose, very friable; common fine roots; slightly acid; abrupt smooth boundary.
- Bt1—29 to 41 inches; brownish yellow (10YR 6/8) sandy clay loam, yellowish brown (10YR 5/8) moist; moderate medium subangular blocky structure; hard, firm; few fine roots; common fine pores; few distinct clay films on faces of peds; common medium prominent yellowish red (5YR 5/8) and few medium distinct light yellowish brown (10YR 6/4) masses of iron accumulation; slightly acid; clear smooth boundary.
- Bt2—41 to 48 inches; brownish yellow (10YR 6/8), sandy clay loam, yellowish brown (10YR 5/8) moist; moderate medium subangular blocky structure; very hard, firm; few fine roots; common fine pores; common distinct clay films on faces of peds; common medium distinct yellowish red (5YR 5/8) masses of iron accumulation; light brownish gray (10YR 6/2) streaks and coatings of sand particles on faces of peds; strongly acid; gradual wavy boundary.
- Bt3—48 to 63 inches; brownish yellow (10YR 6/8) sandy clay loam, yellowish brown (10YR 5/8) moist; moderate coarse subangular blocky structure; very hard, firm; few fine roots; common fine pores; common distinct clay films on faces of peds; common medium distinct yellowish red (5YR 5/8) masses of iron accumulation; light brownish gray (10YR 6/2) streaks and coatings of sand particles on faces of peds; strongly acid; gradual wavy boundary.
- BCt—63 to 80 inches; distinctly mottled red (2.5YR 5/8) and brownish yellow (10YR 6/8) sandy clay loam; weak coarse subangular blocky structure; very hard, firm; few very fine roots; few distinct clay films on faces of peds; light brownish gray (10YR 6/2) streaks and coatings of sand particles on faces of peds; few fine black concretions; strongly acid.

The solum is 60 to more than 80 inches thick. The content of ironstone pebbles ranges from 0 to 5 percent throughout the solum.

The A horizon is pale brown, brown, dark yellowish brown, or yellowish brown. The E horizon is very pale brown, brown, light yellowish brown, light brown, or yellowish



Figure 26.—Profile of Silstid loamy fine sand. The surface layer is thick and sandy.

brown. Reaction ranges from moderately acid to neutral. The combined thickness of the A and E horizons ranges from 20 to 40 inches.

The Bt horizon is brownish yellow, yellowish brown, reddish yellow, or yellow. It has few to many redoximorphic features in shades of red, yellow, and brown. Texture is fine sandy loam, loam, or sandy clay loam. The clay content of the particle-size control section ranges from 20 to 32 percent. In some pedons the lower part of the horizon has gray streaks of uncoated sand. Reaction ranges from strongly acid to slightly acid.

The BCt horizon is in shades of red, gray, yellow, or brown or is a mottled matrix of

these colors. It has few to many redoximorphic features in the same colors. Texture is fine sandy loam or sandy clay loam. Reaction is strongly acid or moderately acid.

Spiller Series

The Spiller series consists of very deep, very gently sloping, moderately well drained, slowly permeable soils on uplands. These soils formed in thinly stratified loamy sediments and shale. Slopes range from 1 to 3 percent. The soils are classified as fine, mixed, semiactive, thermic Ultic Paleustalfs.

Typical pedon of Spiller fine sandy loam, 1 to 3 percent slopes; from the intersection of U.S. Highway 79 and Farm Road 46 in Franklin, 0.2 mile south on Farm Road 46, about 10.1 miles southeast on Farm Road 2446, about 90 feet southwest on County Road 313, about 0.5 mile southeast on a field road, 60 feet west in improved pasture:

- Ap—0 to 8 inches; brown (10YR 4/3) fine sandy loam, dark brown (10YR 3/3) moist; weak fine and medium subangular blocky structure parting to weak fine granular; soft, very friable; common fine and medium roots; slightly acid; clear smooth boundary.
- E—8 to 12 inches; yellowish brown (10YR 5/4) fine sandy loam, dark yellowish brown (10YR 3/4) moist; weak fine and medium subangular blocky structure parting to weak fine granular; soft, very friable; common fine and medium roots; about 1 percent rounded ironstone pebbles; neutral; clear smooth boundary.
- Bt1—12 to 21 inches; dark yellowish brown (10YR 4/4) clay, dark yellowish brown (10YR 3/4) moist; strong fine and medium subangular blocky structure; hard, firm; common fine roots; common fine pores; many distinct clay films on faces of peds; many fine and medium prominent dark red (2.5YR 3/6) and few medium faint yellowish brown (10YR 5/8) masses of iron accumulation; slightly acid; clear smooth boundary.
- Bt2—21 to 33 inches; brownish yellow (10YR 6/8) clay, yellowish brown (10YR 5/8) moist; weak medium prismatic structure parting to strong fine and medium subangular blocky; hard, firm; common fine roots; common fine pores; many prominent clay films on faces of peds; common fine and medium prominent red (2.5YR 4/8) and few fine and medium faint dark yellowish brown (10YR 4/4) masses of iron accumulation; moderately acid; gradual smooth boundary.
- Bt3—33 to 53 inches; brownish yellow (10YR 6/8) clay, yellowish brown (10YR 5/8) moist; moderate medium prismatic structure parting to moderate fine and medium subangular blocky; hard, firm; few fine roots; common fine pores; common prominent clay films on faces of peds; common medium prominent red (2.5YR 4/8) masses of iron accumulation; common fine and medium distinct light brownish gray (10YR 6/2) iron depletions on vertical faces of prisms; moderately acid; clear smooth boundary.
- BCt—53 to 59 inches; brownish yellow (10YR 6/8) clay loam, yellowish brown (10YR 5/8) moist; weak coarse prismatic structure parting to weak medium subangular blocky; hard, firm; few fine roots; few prominent clay films on faces of peds; common fine prominent red (2.5YR 4/8) masses of iron accumulation; common fine and medium distinct light brownish gray (10YR 6/2) iron depletions on vertical faces of prisms; moderately acid; clear smooth boundary.
- C—59 to 80 inches; prominently mottled yellow (10YR 7/8) and red (2.5YR 5/6) sandy clay loam that has thin strata of light gray (10YR 7/2) shale; massive; hard, firm; slightly acid.

The solum is 50 to more than 60 inches thick. The clay content of the particle-size control section ranges from 35 to 45 percent. Base saturation ranges from 35 to 75 percent throughout the argillic horizon. In some pedons, the content of ironstone pebbles ranges from 1 to 15 percent throughout the solum.

The A horizon is dark brown, brown, or yellowish brown. The E horizon is brown, dark yellowish brown, yellowish brown, light yellowish brown, or pale brown. Reaction ranges from moderately acid to neutral. The combined A and E horizons range from 10 to 20 inches in thickness.

The Bt horizon is dark yellowish brown, yellowish brown, brownish yellow, or light yellowish brown. It has few to many redoximorphic features in shades of red, yellow, or brown. In some pedons it has redoximorphic features in shades of gray in the lower part. Texture is clay loam, sandy clay, or clay. Reaction ranges from strongly acid to neutral.

The BCt horizon is dark yellowish brown, yellowish brown, brownish yellow, or light yellowish brown. It has few to many redoximorphic features in shades of red, yellow, or gray. Texture is loam, clay loam, sandy clay loam, or sandy clay. Reaction ranges from strongly acid to slightly acid.

The C horizon is yellowish brown, light yellowish brown, brownish yellow, yellow, light gray, light brownish gray, red, or reddish yellow. It is fine sandy loam, loam, or sandy clay loam that has strata of shale 1 to 5 inches thick. Reaction ranges from strongly acid to moderately alkaline.

Tabor Series

The Tabor series consists of very deep, nearly level, moderately well drained, very slowly permeable soils on stream terraces and terrace remnants on uplands. These soils formed in clayey and loamy sediments. Slopes range from 0 to 2 percent. The soils are classified as fine, smectitic, thermic Oxyaquic Vertic Paleustalfs.

Typical pedon of Tabor fine sandy loam, 0 to 2 percent slopes; from the intersection of U.S. Highway 79 and Farm Road 46 in Franklin, 4.0 miles north on Farm Road 46, about 3.2 miles west on Farm Road 979, about 1.1 miles south and 0.3 mile west on County Road 129, about 500 feet south in improved pasture:

- Ap—0 to 4 inches; brown (10YR 5/3) fine sandy loam, brown (10YR 4/3) moist; weak fine subangular blocky structure; hard, friable; many fine roots; slightly acid; clear smooth boundary.
- E—4 to 13 inches; light yellowish brown (10YR 6/4) fine sandy loam, yellowish brown (10YR 5/4) moist; weak medium subangular blocky structure; hard, friable; many fine roots; slightly acid; clear wavy boundary.
- BE—13 to 17 inches; pale brown (10YR 6/3) fine sandy loam, brown (10YR 5/3) moist; moderate medium subangular blocky structure; soft, friable; common fine roots; common fine and medium distinct brown (7.5YR 4/4) masses of iron accumulation; slightly acid; clear wavy boundary.
- Bt—17 to 28 inches; yellowish brown (10YR 5/4) clay, dark yellowish brown (10YR 4/4) moist; moderate medium angular blocky structure; very hard, very firm; common fine roots; common fine pores; common distinct pressure faces; common distinct clay films on faces of peds; common fine prominent red (2.5YR 4/8) and few fine distinct brownish yellow (10YR 6/8) masses of iron accumulation; strongly acid; clear wavy boundary.
- Btss1—28 to 40 inches; light brownish gray (10YR 6/2) clay, grayish brown (10YR 5/2) moist; weak coarse prismatic structure parting to weak medium angular blocky; very hard, very firm; common fine roots; common fine pores; common distinct pressure faces; few distinct slickensides; common distinct clay films on faces of peds and on surfaces along root channels; common medium distinct yellowish brown (10YR 5/8) and few fine prominent red (2.5YR 5/8) masses of iron accumulation; slightly acid; gradual wavy boundary.
- Btss2—40 to 58 inches; light brownish gray (10YR 6/2) clay, grayish brown (10YR 5/2)

moist; weak coarse prismatic structure parting to weak medium angular blocky; very hard, very firm; common distinct pressure faces; few distinct slickensides; common distinct clay films on faces of peds; common fine iron-manganese concretions; common medium distinct brownish yellow (10YR 6/6) masses of iron accumulation; neutral; gradual wavy boundary.

BCtg—58 to 80 inches; light gray (10YR 7/2) clay loam, light brownish gray (10YR 6/2) moist; weak coarse prismatic structure; very hard, firm; few distinct clay films on faces of peds; few fine iron-manganese concretions; few fine calcium carbonate concretions; common coarse distinct strong brown (7.5YR 5/8) masses of iron accumulation; slightly alkaline.

The solum is 60 to more than 80 inches thick. The clay content of the particle-size control section ranges from 45 to 55 percent.

The A horizon is brown, pale brown, light brownish gray, or grayish brown. The E horizon is pale brown, very pale brown, or light yellowish brown. The A and E horizons range from strongly acid to slightly acid. The combined thickness of the A and E horizons ranges from 10 to 18 inches.

The BE horizon is brown, pale brown, light yellowish brown, or very pale brown. It has none to common redoximorphic features in shades of brown or yellow. Texture is fine sandy loam or sandy clay loam. Reaction ranges from strongly acid to slightly acid.

The Bt and Btss horizons are brown, dark yellowish brown, yellowish brown, light yellowish brown, brownish yellow, light olive brown, grayish brown, or light brownish gray. They have few to many redoximorphic features in shades of red, brown, yellow, or gray. Some pedons have a mottled matrix that is dominated by redoximorphic features in these colors. These horizons are mainly clay, but in some pedons the lower part of the Btss horizon is clay loam. Reaction is very strongly acid or strongly acid in the Bt horizon and ranges to neutral in the lower part of the Btss horizon.

The BCtg horizon is gray, grayish brown, light brownish gray, or light gray. Texture is sandy clay loam, clay loam, or clay. The content of calcium sulfate crystals, iron-manganese concretions, and calcium carbonate concretions ranges from none to common. Reaction ranges from moderately acid to slightly alkaline.

Uhland Series

The Uhland series consists of very deep, nearly level, moderately well drained, moderately slowly permeable soils on flood plains. These soils formed in sandy and loamy alluvium. Slopes are 0 to 1 percent. The soils are classified as coarse-loamy, siliceous, superactive, thermic Aquic Haplustepts.

Typical pedon of Uhland loam, 0 to 1 percent slopes, frequently flooded (fig. 27); from the intersection of Farm Road 46 and Farm Road 1644 in Franklin, 6.6 miles west on Farm Road 1644, about 0.4 mile north on a private road, 275 feet north-northwest in rangeland:

A—0 to 3 inches; grayish brown (10YR 5/2) loam, very dark grayish brown (10YR 3/2) moist; moderate fine subangular blocky structure parting to moderate fine granular; hard, firm; many fine and medium roots; common fine and medium tubular pores; common fine prominent reddish brown (5YR 4/4) masses of iron accumulation; few fine iron-manganese concretions; slightly acid; abrupt smooth boundary.

Bw—3 to 15 inches; pale brown (10YR 6/3) very fine sandy loam, brown (10YR 4/3) moist; weak coarse prismatic structure parting to weak very fine subangular blocky; slightly hard, very friable; many fine and medium roots; common fine and medium tubular pores; common fine and medium distinct strong brown (7.5YR 5/6) masses of iron accumulation; few fine faint dark grayish brown (10YR 4/2) iron

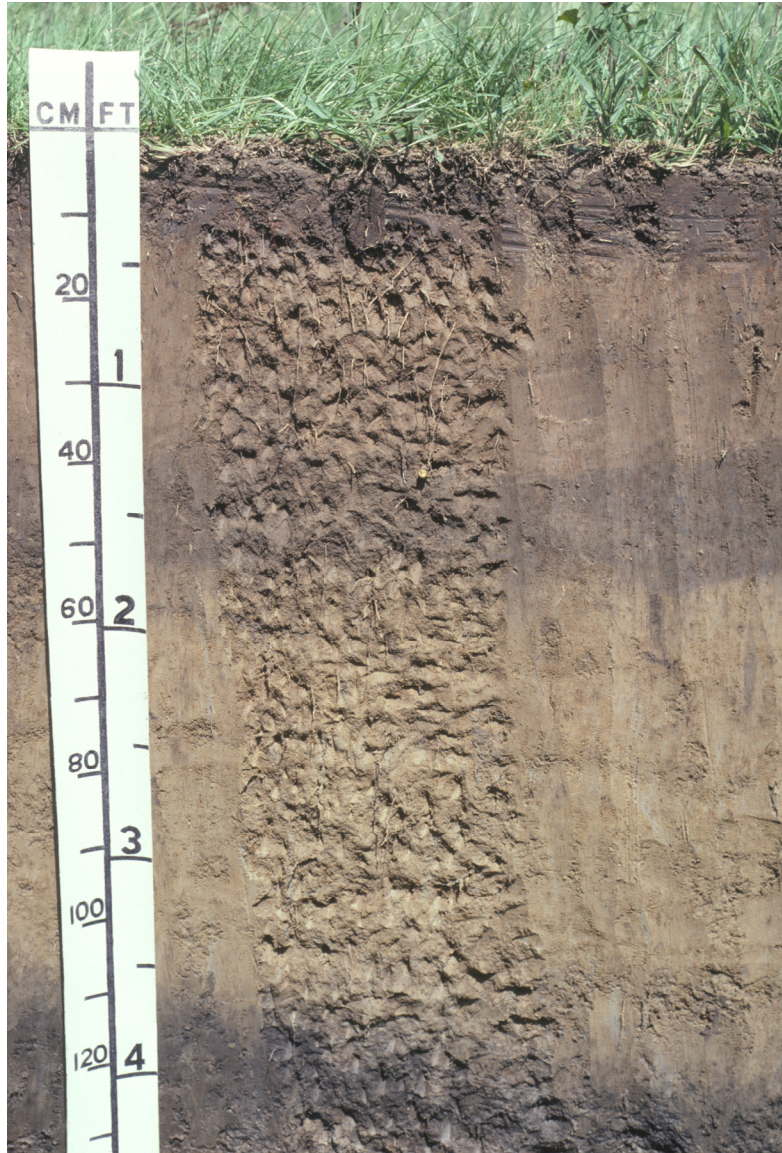


Figure 27.—Profile of Uhland loam. A buried soil horizon is at a depth of about 15 inches.

depletions along root channels; few very fine iron-manganese masses; slightly acid; abrupt smooth boundary.

Ab—15 to 22 inches; brown (10YR 5/3) loam, dark brown (10YR 3/3) moist; weak coarse prismatic structure parting to moderate fine subangular blocky; hard, friable; common fine and medium roots; many fine and few medium tubular pores; few medium distinct brown (7.5YR 4/4) masses of iron accumulation; common fine faint dark gray (10YR 4/1) iron depletions on faces of some prisms and along surfaces of root channels; few fine iron-manganese masses; slightly acid; abrupt smooth boundary.

Bwb—22 to 43 inches; light yellowish brown (10YR 6/4) very fine sandy loam, dark yellowish brown (10YR 4/4) moist; weak coarse prismatic structure parting to weak fine subangular blocky; slightly hard, very friable; common fine roots; common fine and medium tubular pores; common medium distinct dark yellowish

brown (10YR 4/6) masses of iron accumulation; common medium distinct grayish brown (10YR 5/2) iron depletions along surfaces of root channels; few faint bedding planes 0.5 inch to 2.0 inches thick with slightly less clay and lighter colors than the matrix; slightly acid; abrupt smooth boundary.

A' b—43 to 48 inches; gray (10YR 5/1) very fine sandy loam, very dark grayish brown (10YR 3/2) moist; weak coarse prismatic structure parting to weak fine subangular blocky; slightly hard, very friable; few fine roots; few fine pores; common medium distinct grayish brown (10YR 5/2) iron depletions; few fine distinct yellowish brown (10YR 5/6) masses of iron accumulation; slightly acid; clear smooth boundary.

Bgb—48 to 55 inches; light brownish gray (10YR 6/2) very fine sandy loam, gray (10YR 5/1) moist; weak coarse prismatic structure parting to weak fine subangular blocky; hard, friable; few fine roots; many medium distinct dark yellowish brown (10YR 4/6) masses of iron accumulation; about 10 percent iron-manganese concretions; few fine siliceous pebbles; slightly acid; clear smooth boundary.

A' b—55 to 80 inches; gray (10YR 5/1) clay loam, very dark gray (10YR 3/1) moist; moderate medium prismatic structure parting to weak coarse angular blocky; very hard, firm; few very fine roots; common fine distinct dark yellowish brown (10YR 4/6) masses of iron accumulation; common fine iron-manganese concretions in upper part of horizon with few fine iron-manganese masses in lower part; moderately acid.

The solum is more than 80 inches thick. The clay content of the particle-size control section ranges from 10 to 18 percent. Reaction ranges from moderately acid to slightly alkaline throughout the profile. Most pedons have less than 1 percent to about 5 percent siliceous pebbles in some horizons. The content of iron-manganese concretions or masses, or both, is few or common in some horizons.

The A horizon is very dark grayish brown, dark grayish brown, grayish brown, or yellowish brown. It has few or common redoximorphic features in shades of brown or red.

The Bw or Bwb horizon is brown, pale brown, dark yellowish brown, yellowish brown, brownish yellow, or light yellowish brown. The content of iron concentrations in shades of brown, yellow, or red ranges from few to many. The content of iron depletions in shades of brown or gray is few or common in some subhorizons within a depth of 30 inches. Texture is very fine sandy loam, fine sandy loam, or loam with or without strata of loamy fine sand, sandy clay loam, or clay loam.

Buried A horizons are very dark gray, dark gray, dark brown, brown, or dark grayish brown. They have none to common redoximorphic features in shades of brown or yellow. Texture is fine sandy loam, loam, sandy clay loam, or clay loam.

The Bgb horizon is gray, grayish brown, light brownish gray, or light gray. This horizon typically occurs below a depth of 40 inches and does not occur in some pedons. It has few to many redoximorphic features in shades of brown, yellow, or red. Texture is fine sandy loam, loam, sandy clay loam, or clay loam.

Weswood Series

The Weswood series consists of very deep, nearly level to very gently sloping, well drained, moderately permeable soils on flood plains of the Brazos River. These soils formed in calcareous loamy alluvium. Slopes range from 0 to 3 percent. The soils are classified as fine-silty, mixed, superactive, thermic Udifluventic Haplustepts.

Typical pedon of Weswood silt loam, 0 to 1 percent slopes, rarely flooded; from the intersection of Texas Highway 6 and U.S. Highway 79 in Hearne, 2.0 miles west on U.S. Highway 79, about 6.6 miles south on Farm Road 50, about 0.7 mile east on County Road 215, about 900 feet south of a house, in improved pasture:

Soil Survey of Robertson County, Texas

- Ap—0 to 4 inches; brown (7.5YR 5/3) silt loam, brown (7.5YR 4/2) moist; moderate fine and medium subangular blocky structure; slightly hard, friable; many fine and very fine roots; few fine and medium pores; strongly effervescent; slightly alkaline; clear smooth boundary.
- Bw1—4 to 12 inches; brown (7.5YR 5/3) loam, brown (7.5YR 4/3) moist; moderate fine subangular blocky structure; slightly hard, friable; common fine and very fine roots; common fine pores; strongly effervescent; slightly alkaline; clear smooth boundary.
- Bw2—12 to 26 inches; light brown (7.5YR 6/4) very fine sandy loam, brown (7.5YR 5/4) moist; weak coarse prismatic structure parting to moderate fine subangular blocky; slightly hard, friable; common fine roots; common fine pores; few thin films of calcium carbonate mainly on vertical faces of peds; few thin discontinuous bedding planes; strongly effervescent; slightly alkaline; clear smooth boundary.
- BCK—26 to 36 inches; brown (7.5YR 5/4) silt loam, brown (7.5YR 4/4) moist; weak fine and medium subangular blocky structure; slightly hard, friable; common fine roots; common fine pores; few thin films of calcium carbonate mainly on vertical faces of peds; many thin bedding planes; strongly effervescent; moderately alkaline; clear smooth boundary.
- 2Bwb1—36 to 40 inches; strong brown (7.5YR 5/6) silty clay loam, strong brown (7.5YR 4/6) moist; moderate fine and medium subangular blocky structure; slightly hard, friable; common fine roots; few fine and medium pores; very few gray (7.5YR 5/1) organic coatings on faces of some peds; few thin discontinuous bedding planes; strongly effervescent; moderately alkaline; clear smooth boundary.
- 2Bwb2—40 to 54 inches; brown (7.5YR 4/4) silty clay loam, dark brown (7.5YR 3/4) moist; weak medium prismatic structure parting to moderate fine subangular blocky; hard, firm; common fine roots; few fine and medium pores; few medium faint reddish brown (2.5YR 4/4) masses of iron accumulation; very few gray (7.5YR 5/1) organic coatings on faces of some peds; strongly effervescent; moderately alkaline; gradual smooth boundary.
- 2Bwb3—54 to 64 inches; brown (7.5YR 5/4) silt loam, brown (7.5YR 4/4) moist; weak medium prismatic structure parting to moderate fine subangular blocky; slightly hard, friable; few fine roots; few fine and medium pores; very few gray (7.5YR 5/1) organic coatings on faces of some peds; strongly effervescent; moderately alkaline; gradual wavy boundary.
- 3Ab1—64 to 70 inches; brown (7.5YR 4/3) silty clay, dark brown (7.5YR 3/3) moist; moderate fine and very fine subangular blocky structure; hard, friable; few fine roots; few fine and medium pores; common fine snail shell fragments; few medium calcium carbonate nodules; common dark gray (7.5YR 4/1) krotovina; strongly effervescent; slightly alkaline; clear smooth boundary.
- 4Ab2—70 to 80 inches; very dark gray (10YR 3/1) silty clay, black (10YR 2/1) moist; moderate very fine subangular blocky structure; very hard, firm; few fine roots; few fine and medium pores; slightly effervescent; moderately alkaline.

The solum is 60 to more than 80 inches thick. The clay content of the particle-size control section ranges from 18 to 35 percent. The soil ranges from very slightly effervescent to violently effervescent. Reaction is slightly alkaline or moderately alkaline throughout the profile.

The A horizon is brown, light brown, reddish brown, or light reddish brown. Texture is silt loam or silty clay loam.

The Bw, Bwb, and BCK horizons are brown, light brown, reddish brown, light reddish brown, yellowish red, or reddish yellow. Texture is very fine sandy loam, loam, silt loam, or silty clay loam.

The 3Ab and 4Ab horizons are very dark brown, dark brown, dark reddish brown, very dark gray, or black. These horizons are typically below a depth of 40 inches. They are silt loam, silty clay loam, or silty clay.

Whitesboro Series

The Whitesboro series consists of very deep, nearly level, moderately well drained, moderately permeable soils on flood plains. These soils formed in loamy alluvium. Slopes are 0 to 1 percent. The soils are classified as fine-loamy, mixed, superactive, thermic Cumulic Haplustolls.

Typical pedon of Whitesboro clay loam, 0 to 1 percent slopes, frequently flooded; from the intersection of Texas Highway 6 and Old San Antonio Road in Benchley, 0.2 mile east on Old San Antonio Road, 1.7 miles north and 0.1 mile west on a private road, 100 feet north in rangeland:

- A1—0 to 11 inches; dark grayish brown (10YR 4/2) clay loam, very dark grayish brown (10YR 3/2) moist; moderate medium granular structure; hard, firm; many fine roots; common fine pores; slightly acid; clear smooth boundary.
- A2—11 to 22 inches; brown (10YR 4/3) clay loam, dark brown (10YR 3/3) moist; moderate medium subangular blocky structure; hard, friable; common fine roots; common fine pores; slightly acid; clear smooth boundary.
- Bw1—22 to 29 inches; brown (10YR 5/3) clay loam, brown (10YR 4/3) moist; moderate medium subangular structure; hard, firm; common fine roots; common fine and very fine pores; few fine distinct light brownish gray (10YR 6/2) iron depletions; neutral; clear smooth boundary.
- Bw2—29 to 35 inches; dark gray (10YR 4/1) loam, very dark gray (10YR 3/1) moist; weak medium subangular blocky structure; slightly hard, friable; few fine roots; common fine pores; few fine distinct dark yellowish brown (10YR 4/6) masses of iron accumulation; neutral; clear smooth boundary.
- Bw3—35 to 57 inches; brown (10YR 5/3) loam, brown (10YR 4/3) moist; weak medium subangular blocky structure; slightly hard, friable; few very fine roots; few very fine pores; neutral; clear smooth boundary.
- Bw4—57 to 80 inches; yellowish brown (10YR 5/4) loam, dark yellowish brown (10YR 4/4) moist; weak medium subangular blocky structure; slightly hard, friable; few fine black concretions; neutral.

The solum is more than 60 inches thick. The clay content of the particle-size control section ranges from 22 to 35 percent.

The thickness of the A horizon ranges from 20 to more than 30 inches. The horizon is dark gray, dark grayish brown, dark brown, very dark gray, or very dark grayish brown. Reaction ranges from slightly acid to slightly alkaline.

The Bw horizon is brown, dark grayish brown, grayish brown, or yellowish brown. The content of redoximorphic features in shades of brown, gray, red, or yellow ranges from few to many in the upper part of the horizon and is few or common in the lower part. Texture is loam, sandy clay loam, or clay loam. Reaction is slightly acid or neutral in the upper part and ranges from neutral to moderately alkaline in the lower part.

Wilson Series

The Wilson series consists of very deep, nearly level, moderately well drained, very slowly permeable soils on terraces or terrace remnants on uplands. These soils formed in alkaline clayey sediments. Slopes are 0 to 1 percent. The soils are classified as fine, smectitic, thermic Oxyaquic Vertic Haplustalfs.

Typical pedon of Wilson loam, 0 to 1 percent slopes; from the intersection of Texas Highway 6 and Farm Road 979 in Calvert, 3.0 miles north on Texas Highway 6, about 6.2 miles north on Farm Road 2159, about 150 feet west in improved pasture:

- Ap—0 to 7 inches; dark grayish brown (10YR 4/2) loam, very dark grayish brown (10YR 3/2) moist; weak fine granular structure; massive when dry; hard, friable; common fine roots; common fine pores; neutral; abrupt wavy boundary.

Soil Survey of Robertson County, Texas

- Bt—7 to 19 inches; very dark gray (10YR 3/1) clay loam, black (10YR 2/1) moist; moderate medium angular blocky structure; hard, firm; few fine roots; few fine pores; common faint clay films on faces of peds; neutral; gradual wavy boundary.
- Btssg1—19 to 31 inches; very dark gray (10YR 3/1) clay, black (10YR 2/1) moist; moderate medium angular blocky structure; extremely hard, very firm; few fine roots; few fine pores; common fine pores; few distinct slickensides; few distinct pressure faces; common distinct clay films on faces of peds; slightly alkaline; gradual wavy boundary.
- Btssg2—31 to 42 inches; dark gray (10YR 4/1) clay, very dark gray (10YR 3/1) moist; moderate medium coarse angular blocky structure; very hard, very firm; few fine roots; few fine pores; few distinct slickensides; common distinct pressure faces; common distinct clay films on faces of peds; about 1 percent fine siliceous gravel; few medium faint brown (10YR 5/3) masses of iron accumulation; slightly alkaline; clear smooth boundary.
- Btkss—42 to 52 inches; grayish brown (10YR 5/2) clay, dark grayish brown (10YR 4/2) moist; moderate medium angular blocky structure; very hard, very firm; few fine roots; few fine pores; few distinct slickensides; few distinct pressure faces; common distinct clay films on faces of peds; few films, threads, and concretions of calcium carbonate; few fine faint light brownish gray (10YR 6/2) iron depletions; slightly alkaline; gradual wavy boundary.
- BCK—52 to 67 inches; light gray (2.5Y 7/2) clay, light brownish gray (2.5Y 6/2) moist; fine coarse angular blocky structure; very hard, very firm; few fine roots; common fine concretions and some masses of calcium carbonate; few fine iron-manganese concretions; dark grayish brown (10YR 4/2) clay in vertical cracks; slightly alkaline; clear smooth boundary.
- 2CBk—67 to 75 inches; distinctly mottled light gray (10YR 7/2) and light brown (7.5YR 6/4) clay; weak coarse angular blocky structure; very hard, very firm; common fine calcium carbonate concretions; moderately alkaline; gradual smooth boundary.
- 2C—75 to 80 inches; light brown (7.5YR 6/4) clay, brown (7.5YR 5/4) moist; massive; very hard, very firm; few fine distinct gray (10YR 6/1) iron depletions; moderately alkaline.

The solum is 60 to more than 80 inches thick. The clay content of the particle-size control section ranges from 35 to 50 percent. Slickensides and pressure faces are few or common in amount and begin at a depth of 14 to 26 inches.

The A horizon is very dark gray, dark gray, gray, very dark grayish brown, dark grayish brown, or grayish brown. It is massive and hard or very hard when dry.

Reaction ranges from moderately acid to neutral.

The Bt horizon is very dark gray, dark gray, or black. It has none to common iron concentrations in shades of brown or yellow. Texture is clay loam or clay. The horizon has few or common ironstone and siliceous pebbles. Reaction is slightly acid to slightly alkaline.

The Btssg horizon is very dark gray, dark gray, gray, dark grayish brown, or grayish brown. It has none to common iron concentrations in shades of yellow, brown, or olive. Texture is clay or silty clay. Reaction ranges from moderately acid to slightly alkaline.

The Btkss and BCK horizons are in shades of gray or brown. They have few to many redoximorphic features in shades of red, yellow, gray, brown, or olive. Texture is clay loam or clay. The content of concretions and soft masses of calcium carbonate ranges from none to common. The content of iron-manganese concretions ranges from none to common. Reaction is neutral to moderately alkaline.

The 2CBk and 2C horizons are in shades of gray, pink, or brown. They have none to common redoximorphic features in shades of yellow, gray, brown, or olive. Texture is clay loam or clay. Reaction ranges from neutral to moderately alkaline. Some pedons do not have 2CBk and 2C horizons.

Yahola Series

The Yahola series consists of very deep, nearly level, well drained, moderately rapidly permeable soils on the flood plain of the Brazos River. These soils formed in loamy alluvium. Slopes range from 0 to 3 percent. The soils are classified as coarse-loamy, mixed, superactive, calcareous, thermic Udic Ustifluvents.

Typical pedon of Yahola fine sandy loam, 0 to 2 percent slopes, rarely flooded; from the intersection of Farm Road 1644 and County Road 112, about 1.0 mile west of Calvert, 3.6 miles west on County Road 112, about 300 feet east-northeast in improved pasture:

- Ap—0 to 7 inches; brown (7.5YR 5/4) fine sandy loam, brown (7.5YR 4/4) moist; weak fine subangular blocky structure; slightly hard, very friable; common fine roots; strongly effervescent; moderately alkaline; clear smooth boundary.
- A—7 to 13 inches; brown (7.5YR 5/4) fine sandy loam, brown (7.5YR 4/4) moist; weak fine subangular blocky structure; slightly hard, very friable; common fine roots; strongly effervescent; moderately alkaline; abrupt smooth boundary.
- C1—13 to 25 inches; pink (7.5YR 7/4) very fine sandy loam, brown (7.5YR 5/4) moist; massive; soft, very friable; few fine roots; strongly effervescent; moderately alkaline; clear smooth boundary.
- C2—25 to 44 inches; light brown (7.5YR 6/4) fine sandy loam, brown (7.5YR 5/4) moist; massive; soft, very friable; few fine roots; strongly effervescent; moderately alkaline; abrupt smooth boundary.
- C3—44 to 54 inches; reddish yellow (7.5YR 6/6) fine sandy loam, strong brown (7.5YR 5/6) moist; massive; soft, very friable; few fine roots; thin strata of light brown (7.5YR 6/4) fine sandy loam; strongly effervescent; moderately alkaline; abrupt smooth boundary.
- C4—54 to 65 inches; light brown (7.5YR 6/4) fine sandy loam, brown (7.5YR 5/4) moist; massive; soft, very friable; few fine roots; strongly effervescent; moderately alkaline; abrupt smooth boundary.
- C5—65 to 80 inches; strong brown (7.5YR 5/6) very fine sandy loam, strong brown (7.5YR 4/6) moist; massive; soft, very friable; few fine roots; strongly effervescent; moderately alkaline.

The soil is moderately alkaline and slightly effervescent or strongly effervescent throughout the profile. In some pedons, the soil is noneffervescent to a depth of 10 inches and slightly alkaline.

The A horizon is brown, light brown, reddish brown, light reddish brown, reddish yellow, or yellowish red.

The C horizon is brown, light brown, pink, reddish brown, light reddish brown, yellowish red, or reddish yellow. Texture is fine sandy loam, very fine sandy loam, or silt loam. Some pedons contain thin strata of loamy fine sand, silt loam, silty clay loam, or silty clay. The clay content of the particle-size control section ranges from 5 to 18 percent.

Zilaboy Series

The Zilaboy series consists of very deep, nearly level, moderately well drained, very slowly permeable soils on flood plains. These soils formed in clayey alluvium. Slopes are 0 to 1 percent. The soils are classified as fine, smectitic, thermic Oxyaquic Hapluderts.

Typical pedon of Zilaboy clay, 0 to 1 percent slopes, frequently flooded; from the intersection of U.S. Highway 79 and County Road 355, about 1.5 miles east of Easterly, 4.1 miles southeast on County Road 355, about 1.2 miles northeast on a private road, 500 feet southeast in rangeland:

A—0 to 7 inches; gray (10YR 5/1) clay, very dark gray (10YR 3/1) moist; moderate fine and medium angular blocky structure; extremely hard, very firm; very sticky, very plastic; many fine roots; few fine iron-manganese concretions; slightly acid; abrupt wavy boundary.

Bssg1—7 to 19 inches; grayish brown (10YR 5/2) clay, dark grayish brown (10YR 4/2) moist; moderate medium angular blocky structure; extremely hard, very firm; very sticky, very plastic; common fine roots; common distinct pressure faces; few distinct slickensides in lower part of horizon; common fine and medium distinct strong brown (7.5YR 5/6) masses of iron accumulation; moderately acid; gradual wavy boundary.

Bssg2—19 to 32 inches; dark grayish brown (10YR 4/2) clay, dark grayish brown (10YR 4/2) moist; moderate medium angular blocky structure; extremely hard, very firm; very sticky, very plastic; few fine roots; few fine and medium pores; common distinct pressure faces; common distinct slickensides; moderately acid; gradual wavy boundary.

Bssg3—32 to 49 inches; grayish brown (10YR 5/2) clay, dark grayish brown (10YR 4/2) moist; weak medium angular blocky structure; extremely hard, very firm; very sticky, very plastic; few fine roots; few very fine and fine pores; common distinct slickensides; few fine iron-manganese concretions; few fine distinct brown (7.5YR 4/4) masses of iron accumulation; moderately acid; gradual wavy boundary.

Bssg4—49 to 64 inches; grayish brown (10YR 5/2) clay, dark grayish brown (10YR 4/2) moist; weak medium and coarse angular blocky structure; extremely hard, firm; very sticky, very plastic; few fine roots; common distinct slickensides; common fine streaks of calcium sulfate crystals or neutral salts; few fine distinct brown (7.5YR 4/4) masses of iron accumulation; moderately acid; clear wavy boundary.

Bssg5—64 to 80 inches; grayish brown (10YR 5/2) clay, dark grayish brown (10YR 4/2) moist; weak medium and coarse angular blocky structure; extremely hard, firm; very sticky, very plastic; very few fine roots; common distinct slickensides; few fine iron-manganese concretions; few fine streaks of calcium sulfate crystals or neutral salts; common fine distinct brown (7.5YR 4/4) masses of iron accumulation; common medium faint light brownish gray (10YR 6/2) iron depletions; moderately acid.

The solum is more than 80 inches thick. The clay content of the particle-size control section ranges from 40 to 60 percent. Undisturbed areas have gilgai microrelief where microknolls are about 4 to 10 inches higher than microdepressions. When the soil is dry, cracks 0.5 inch to 2.0 inches wide are at the surface and extend to a depth of 20 inches or more. Slickensides begin at a depth of 10 to 24 inches and extend to a depth of 40 inches or more. The content of iron-manganese concretions and masses ranges from none to common throughout the profile.

The A horizon is very dark gray, very dark grayish brown, or grayish brown. Reaction ranges from moderately acid to neutral.

The Bssg horizon is very dark gray, dark gray, dark grayish brown, or brown. It has few to many redoximorphic features in shades of gray, brown, or yellow. The content of calcium sulfate crystals or neutral salts ranges from none to common. Reaction ranges from moderately acid to slightly acid.

Formation of the Soils

This section describes the factors of soil formation and relates them to the soils in Robertson County. It also discusses the processes of horizon differentiation and the geology of the survey area.

Factors of Soil Formation

Soil is formed by the action of soil-forming processes on material deposited or accumulated by geological forces. The characteristics of a soil at any given point depend on the physical and mineralogical composition of the parent material; the climate under which the soil material has accumulated and has existed since accumulation; the plant and animal life on and in the soil; the relief, or lay of the land; and the length of time the forces of soil development have acted on the soil material.

All of the soil-forming factors are important in the genesis of each soil. Some factors, however, have had more influence than others on a given soil.

Parent Material

Parent material is the unconsolidated mass from which a soil forms. It determines the chemical and mineral composition of the soil. In Robertson County, the parent material consists of unconsolidated, sandy, loamy, and clayey sediments deposited by water from the Eocene, Pleistocene, and Holocene Epochs.

Eocene-age sediments outcropping in the county are in the Midway Group, Wilcox Group, and Claiborne Group. Soils on uplands formed from these sediments. Pleistocene-age sediments are on the various fluvial terrace levels of the Brazos, Little Brazos, and Navasota Rivers. These fluvial terraces are sparsely deposited along adjacent tributaries, including Walnut, Mud, Pin Oak, Dunn, Spring, and Duck Creeks. Holocene-age alluvial deposits are on flood plains along the Brazos, Little Brazos, and Navasota Rivers, their major tributaries, and smaller streams.

The relationship between parent material and the different soils in the county is described in under "Geology."

Climate

The warm and humid climate of Robertson County promotes rapid soil development. The climate is uniform throughout the survey area; however, its effect is modified locally by runoff. In some areas, the direction of exposure influences climatic effect. The climate in the county is not considered to have made major differences among the soils.

Plant and Animal Life

Plants, insects, earthworms, small mammals, micro-organisms, and other living organisms, including humans, have contributed to soil development. The addition of organic matter and nitrogen to the soil, the addition and removal of plant nutrients, and changes in structure and porosity are caused by plants, animals, and humans. Plants

probably have affected soil formation in Robertson County more than other kinds of living organisms. Soils that formed under grasses tend to have a higher content of organic matter in the surface layer than soils that formed under trees.

Relief

Relief, or topography, influences soil development through its effect on drainage, erosion, and plant cover.

The soils in Robertson County range from nearly level to moderately steep; however, most of the county is gently sloping. The nearly level areas consist of flood plains throughout the county and the lower terraces associated with them. The more sloping areas are confined to the uplands and the higher-lying terraces or terrace remnants.

The degree of soil profile development often depends on the amount of moisture in the soil. Navasota soils are in nearly level, somewhat poorly drained areas that receive extra water. As a result, they have developed gleyed characteristics and the horizon development is not as well defined. Edge soils are in more sloping areas that are better drained and exhibit brighter colors and distinct horizons throughout. Soils on footslopes, such as Benchley soils, receive additional organic matter and have a thick, dark surface layer. Soils on adjacent side slopes, such as Crockett soils, have a thin surface layer that is light in color because erosion removed most of the soil as quickly as it began to form a surface layer.

Time

A great length of time is required for the formation of soils with distinct horizons. The differences in the length of time that the parent material has been in place generally are reflected in the degree of horizon development. Young soils have little horizon development, and old soils have well expressed development.

Sandow and Uhland soils are young soils and are on nearly level flood plains. Although they have undergone some horizon development, they closely resemble the loamy and sandy parent material from which they formed. Benchley and Crockett soils are older soils. They have developed distinct horizons that do not resemble their parent materials.

Process of Horizon Differentiation

Several processes are involved in the formation of horizons in soils. These processes include accumulation of organic matter, leaching of carbonates and other bases, and formation and translocation of silicate clay minerals. In most soils more than one of these processes has been active in horizon development.

The accumulation of organic matter in the upper part of a profile results in the formation of a distinct, dark surface layer. The soils in Robertson County range from low to high in content of organic matter. Benchley and Cadelake soils have accumulated organic matter and have a dark surface layer.

Carbonates have been leached downward in most of the soils in the county. Much leaching has occurred in the soils that have thick, sandy surface layers, such as Padina and Silstid soils. Carbonates still remain in the profile of the clayey Luling soils.

The translocation of clay minerals has also contributed to horizon development in many soils. Clay minerals are produced by weathering of primary minerals. In many soils, the subsoil has accumulations of clay films in pores and on ped surfaces. These soils were probably leached of carbonates and bases before the translocation of silicate clay occurred. A horizon with an accumulation of translocated clay is called an argillic horizon. Edge soils are an example of soils that have an argillic horizon.

Geology

Max Bircket, Geologist, National Resources Conservation Service, prepared this section.

Outcrops of sedimentary strata form long, narrow bands trending in a north-northeast to south-southwest direction across Robertson County. These strata were originally deposited during the Tertiary Period as fluvial, deltaic, and shallow marine sand, clay, silt, and lime mud. Compression and other rock-forming processes subsequently consolidated the sediment to bedrock. The bedrock includes strata composed of poorly cemented sand, consolidated sandstone, shale, and limestone. Unconsolidated fluvial deposits of the Quaternary Period occur along streams on Pleistocene terraces and Holocene flood plains. These deposits are prominent along the Brazos, Little Brazos, and Navasota Rivers, their tributaries, and other smaller creeks.

Individual strata are combined into geologic units that can be mapped at a desired scale. The basic geologic map unit is the formation. A formation may be divided into members; and formations may be combined to constitute a group. A group, formation, or member name usually is derived from a typical outcrop location or from lithologic characteristics at the location where the stratum was named. The Simsboro Formation, for example, was named after an outcrop near the town of Simsboro in Freestone County (12).

Lithologic and mineralogic characteristics determine relative resistance to erosion and thus soil topographic position. Clay-ironstone, for example, is common in many formations, especially in the central and south-central parts of the county. Soils that developed over these formations with erosion-resistant layers of iron minerals or ironstone concretions are typically on high ridges or in the more sloping areas. Large volumes of ironstone have been quarried from these areas for road ballast; however, the exposed surfaces are still relatively resistant to erosion. A more subdued topography has developed over erodible, poorly cemented sand and shale outcrops.

The landscape and surface drainage of the survey area formed during the Pleistocene age. The survey area is irregularly shaped and lies between the Brazos River on the west and the Navasota River on the east. The drainage is almost evenly divided. Most areas west of Franklin drain toward the Brazos River, and those east of the town drain toward the Navasota River.

Most soils in Robertson County formed by the weathering of Tertiary-age sand, sandstone, shale, and siltstone. Quaternary fluvial sediments derived from older rocks are the source of parent materials for terrace and flood-plain soils. Post oak woodland and discontinuous prairies formed on sand and shale in the north and north-central parts of the county. Sandy and loamy soils formed in thick beds of sand capped by ridges of clay ironstone in the central and south-central sectors of the county. Prairie soils formed on shale in the extreme southern part of Robertson County.

The time required for most soil development in Robertson County is at least 500,000 years. Rainfall, temperature, and vegetation have varied greatly during this time. Soil characteristics reflect these climatic and vegetative changes and lithologic properties of bedrock and parent material. Consequently, a general correspondence exists among the county's general soil map units and geologic outcrops depicted on the Waco and Austin Sheets of the Geologic Atlas of Texas (21, 22). Similar comparisons can be made with the smaller scale Geologic Map of Texas (23) and the Land Resource Map (5).

Tertiary Period-Eocene Epoch

Outcrops of Eocene-age sediments are represented in Robertson County by formations in the Midway, Wilcox, and Claiborne Groups (11). These ancient sediment deposits provide a record of a sequence of marine transgression and regression. A

transgression is an advance of the sea over land, which results in a decrease in land area and an increase in a marine sediment depositional environment. Conversely, a regression results in an increase in land area and an increase in deltaic and fluvial sediment deposition. This diversity in depositional environments has resulted in a diversity of the lithologic and mineralogic characteristics of rock outcrop. Outcrops of marine sediment commonly are glauconitic fine-grained sand, shale, and mudstone. Fluvial and deltaic sediments generally are coarser grained and tend to be cross bedded and nonglauconitic. The presence of lignite and mudstone sediments indicates standing or very slow-moving water deposits in an interdistributary fluvial or lacustrine depositional environment.

Midway Group

The Wills Point Formation is the youngest formation of the Midway Group. Its outcrop in Robertson County is limited to the extreme northwestern corner of the county where it is in fault contact with the Hooper Formation (21). The outcrop is topographically expressed as a broad, flat to gently rolling, relatively featureless plain. The Wills Point Formation is about 200 to 500 feet thick and consists of laminated clay shale, siltstone, and glauconitic sandstone laid down in a shallow marine depositional environment (3).

Soils of the Edge-Crockett general soil map unit developed over the Wills Point Formation.

Wilcox Group

The outcrop of the Hooper Formation in Robertson County is very limited, extending from the Bremond vicinity to west of Texas Highway 6. The formation was deposited within coalescing deltas formed by streams flowing southeastward (7). The Hooper Formation is composed of sand lenses, clay, silt, and discontinuous thin lignite beds (8).

Soils of the Edge-Crockett general soil map unit formed over the Hooper Formation.

The Simsboro Formation forms a narrow band of rolling hills on a poorly consolidated sand outcrop from upper Walnut Creek extending northwest to Bremond and the Robertson-Falls County line (13, 21). Native vegetation is post oak woodland. The formation is 200 to 300 feet thick, based on data from deep wells. Most of the formation is cross-bedded quartz sand with clay and mudstone conglomerate lenses.

Soils of the Silstid-Padina-Robco general soil map unit formed over the Simsboro Formation.

The Calvert Bluff Formation is exposed on rolling hills and in manmade excavations in the north and north-central parts of the county. This formation was deposited in a complex series of coalescing deltas. Mudstone and lignite represent interdistributary lacustrine and swamp deposits, respectively, whereas sand lenses represent distributary channel deposits (8, 9). The Calvert Bluff Formation is mostly mudstone with subordinate sand lenses and locally important lignite seams. Lignite is being mined near a power plant close to Bremond. Generally, the Calvert Bluff Formation is highly erosive, and deep gullies are common in areas of bedrock and the overlying soils.

Soils in the Edge-Crockett and Tabor-Gasil-Rader general soil map units formed over the Calvert Bluff Formation.

Claiborne Group

The Carrizo Sand is a band of high ridges west of the Navasota River extending to Texas State Highway 6 north of Hearne. The band of ridges topographically expresses the Carrizo Sand in Robertson County. The outcrop width narrows at its western edge. The Carrizo Sand, laid down in a fluvial depositional environment, is mostly fine-grained sand with interbedded clay and ironstone (7).

Soils of the Hearne-Rosanky-Gasil and Silstid-Padina-Robco general soil map units formed over the Carrizo Sand.

The Reklaw Formation outcrop in the county forms a narrow east-west band of low rolling hills on either side of U.S. Highway 79. These hills and interspersed alluvial flats extend from east of the community of Ridge to the northern city limits of Hearne. The flat prairies along U.S. Highway 79 resemble a terrace veneer over part of the Reklaw Formation (17). The Reklaw Formation has two members—the Marquez Shale and the Newby Sand. The Marquez Shale is dominantly clay and silt with interbedded ironstone. The Newby Sand is sand and clay with layers of glauconitic sandstone.

Soils of the Hearne-Rosanky-Gasil general soil map unit formed over the Reklaw Formation.

The Queen City Sand outcrop forms a broad band of hills and ridges that extend from the Ridge community and Camp Creek Lake west to Hearne and Pin Oak Creek. A fluvial depositional environment was dominant when the Queen City Sand was laid down. This formation is dominantly sand and sandstone with thin interbeds of clay, silt, and glauconitic quartz sand.

Soils of the Silstid-Padina-Robco and Hearne-Rosanky-Gasil general soil map units formed over the Queen City Sand.

The Weches Formation outcrop forms a relatively narrow band of gently sloping hills and nearly level prairies that extends from south of Camp Creek Lake to west of Texas Highway 6. The outcrop is distinctly more clayey than the overlying Queen City Sand and underlying Sparta Sand. The Weches Formation is dominantly a fossiliferous marine clay and silt with interbeds of glauconite, sand, and ironstone.

Soils of the Benchley-Luling and Margie-Crockett general soil map units formed over the Weches Formation. The high shrink-swell potential of these soils is a problem when constructing buildings on this formation.

The Sparta Sand outcrop is a broad band of high rolling hills that extends from near the Navasota River west to the Little Brazos River, just north of the Old San Antonio Road. This formation is similar to the Carrizo Sand and Queen City Sand. The Sparta Sand was deposited in a fluvial depositional environment, and the sediment source was apparently the same as that of the Carrizo Sand and Queen City Sand (4). The formation is made up mostly of fine-grained quartz sand with some layers of clay, silt, and ironstone.

The Silstid-Padina-Robco and Hearne-Rosanky-Gasil general soil map units formed in the Sparta Sand.

The Cook Mountain Formation crops out within a narrow band of open prairies that parallels the Old San Antonio Road from near the Navasota River to the community of Benchley. It continues to the Robertson-Brazos County line west to the flood plain of the Little Brazos River. The Cook Mountain Formation outcrop in Robertson County is comprised of marine, calcareous, and noncalcareous, marly clays and shales.

The Benchley-Luling general soil map unit formed on the Cook Mountain Formation.

Quaternary Period-Pleistocene Epoch

Pleistocene stream terraces and their underlying alluvial clay, silt, sand, and gravel sediments are common along the Brazos, Little Brazos, and Navasota Rivers and their major tributaries. These relict sediments are at the higher elevations and are contiguous with the outer extremities of Holocene-age flood-plain sediments. Pleistocene sediments were laid down during depositional episodes when rainfall, and thus stream discharge, were significantly greater than now. This is evidenced by the fact that Pleistocene flood plains are much wider than the Holocene flood plains. In addition, exposures of Pleistocene terrace substrate in gullies and excavations indicate that some of the sediments are thicker than those deposited on Holocene flood plains.

Soils of the Chazos-Dutek-Silawa and the Bremond-Wilson general soil map units

formed on terraces on the east and northeast side of the Little Brazos River. The Chazos-Dutek-Silawa general soil map unit is also mapped on scattered terraces along the Navasota River and Duck Creek (10).

The oldest Pleistocene terraces in Robertson County are underlain by scattered relict gravel deposits that cap some high hills. These gravel deposits are mapped in the southwestern part of the county (22). This ancient alluvium was deposited by a paleo-stream system not related to the modern Brazos and Navasota River systems.

Quaternary Period-Holocene Epoch

Holocene flood-plain alluvium is the youngest geologic unit in the county. These floodwater deposits consist of sediment reworked from Pleistocene alluvium and eroded soil and rock transported from valley slopes and hilltops. Evidence of fluvial transport is observed in eroding vertical streambanks. This evidence includes relict point bars, gravel lenses, cross-bedded sediment, and a general upward decrease in gravel content and grain size. Comparing alluvium and upland soil textures and mineralogy can indicate upland sources. Fossils derived from Tertiary-age and Cretaceous-age bedrock upstream are also in streambed deposits.

Soils on the flood plain along the Navasota River are in the Zilaboy-Navasota-Oletha general soil map unit. The Ships-Highbank and Weswood-Yahola-Coarsewood general soil map units are on the Brazos River flood plain. The Uhland-Sandow-Whitesboro general soil map unit is on flood plains where streams drain soils that developed over sand, sandstone bedrock, shale, and siltstone.

References

- (1) American Association of State Highway and Transportation Officials. 1986. Standard specifications for highway materials and methods of sampling and testing. Ed. 14, 2 vols.
- (2) American Society for Testing and Materials. 1993. Standard classification of soils for engineering purposes. ASTM Stand. D 2487.
- (3) Amesbury, David L. 1998. Geology in soil survey of Limestone County, Texas. (Available in the State Office of the Natural Resources Conservation Service, Temple, Texas)
- (4) Amesbury, David L. 2005. Geology in soil survey of Burleson County, Texas. (Available in the State Office of the Natural Resources Conservation Service, Temple, Texas)
- (5) Austin, Morris E. 1965. Land resource regions and major land resource areas of the United States. U.S. Dep. Agric. Handb. 296.
- (6) Baker, J.W. 1970. A history of Robertson County, Texas. Texian Press. Waco, Texas.
- (7) Jones, Colin M., and W.R. Kaiser. 1986. Carrizo Sand aquifer in east-central Texas and future use of Upper Wilcox lignites; Geology and ground water hydrology of deep-basin lignite in the Wilcox Group of east Texas. Univ. Tex. Bur. Econ. Geology.
- (8) Kaiser, W.R., J.E. Johnston, and W.N. Bach. 1978. Sand-body geometry and the occurrence of lignite in the Eocene of Texas. Univ. Tex. Bur. Econ. Geology Geology Circ. 784.
- (9) Kaiser, W.R., and others. 1986. Geology and ground water hydrology of deep-basin lignite in the Wilcox Group of east Texas. Univ. Tex. Bur. Econ. Geology Special Rep. 86.
- (10) Nordt, L.C. 1986. Regional correlation of terraces and soils of the Brazos, Trinity, and Navasota Rivers of the Tertiary Coast Plain of Texas. Soil Surv. Hor. Vol. 27, No. 1, pp. 29-35.
- (11) Perkins, Bob F., and D. K. Hobday, eds. 1980. Middle Eocene coastal plain and nearshore deposits of east Texas: Gulf Coast section. *In* Society of Economic Paleontologists and Mineralogists Spring Field Trip Guidebook, May 10-11, 1980. (Available from Earth Enterprises, Austin, Texas)
- (12) Plummer, F.B. 1932. Cenozoic systems in Texas: The geology of Texas (Vol. 1.—Stratigraphy). Univ. Tex. Bull. No. 3232, pp. 519-818.

Soil Survey of Robertson County, Texas

- (13) Smith, F.E. 1962. Upper Cretaceous and Lower Tertiary rocks in east-central Texas.
- (14) United States Department of Agriculture, Soil Conservation Service. National soil survey handbook. Soil Surv. Staff. (Available in the State Office of the Natural Resources Conservation Service at Temple, Texas)
- (15) United States Department of Agriculture, Soil Conservation Service. 1907. Robertson County soil survey. (Available in the State Office of the Natural Resources Conservation Service, Temple, Texas)
- (16) United States Department of Agriculture, Soil Conservation Service. 1961. Land capability classification. U.S. Dep. Agric. Handb. 210.
- (17) United States Department of Agriculture, Soil Conservation Service. 1989. Soil survey of Leon County, Texas. (Available in the State Office of the Natural Resources Conservation Service, Temple, Texas)
- (18) United States Department of Agriculture, Soil Conservation Service. 1991. Soil survey laboratory methods manual. Soil Surv. Invest. Rep. 42.
- (19) United States Department of Agriculture, Soil Conservation Service. 1993. Soil survey manual. Soil Surv. Staff. U.S. Dep. Agric. Handb. 18.
- (20) United States Department of Agriculture, Soil Conservation Service. 1999. Soil taxonomy: A basic system of soil classification for making and interpreting soil surveys. 2nd ed. U.S. Dep. Agric. Handb. 436.
- (21) University of Texas, Bureau of Economic Geology. 1970 (revised 1990). Geologic atlas of Texas, Waco sheet.
- (22) University of Texas, Bureau of Economic Geology. 1974. Geologic atlas of Texas, Austin sheet.
- (23) University of Texas, Bureau of Economic Geology. 1992. Geologic map of Texas.

Glossary

ABC soil. A soil having an A, a B, and a C horizon.

AC soil. A soil having only an A and a C horizon. Commonly, such soil formed in recent alluvium or on steep, rocky slopes.

Aeration, soil. The exchange of air in soil with air from the atmosphere. The air in a well aerated soil is similar to that in the atmosphere; the air in a poorly aerated soil is considerably higher in carbon dioxide and lower in oxygen.

Aggregate, soil. Many fine particles held in a single mass or cluster. Natural soil aggregates, such as granules, blocks, or prisms, are called peds. Clods are aggregates produced by tillage or logging.

Alluvium. Material, such as sand, silt, or clay, deposited on land by streams.

Alpha,alpha-dipyridyl. A dye that when dissolved in 1N ammonium acetate is used to detect the presence of reduced iron (Fe II) in the soil. A positive reaction indicates a type of redoximorphic feature.

Animal unit month (AUM). The amount of forage required by one mature cow of approximately 1,000 pounds weight, with or without a calf, for 1 month.

Aquic conditions. Current soil wetness characterized by saturation, reduction, and redoximorphic features.

Area reclaim (in tables). An area difficult to reclaim after the removal of soil for construction and other uses. Revegetation and erosion control are extremely difficult.

Argillic horizon. A subsoil horizon characterized by an accumulation of illuvial clay.

Arroyo. The flat-floored channel of an ephemeral stream, commonly with very steep to vertical banks cut in alluvium.

Aspect. The direction in which a slope faces.

Available water capacity (available moisture capacity). The capacity of soils to hold water available for use by most plants. It is commonly defined as the difference between the amount of soil water at field moisture capacity and the amount at wilting point. It is commonly expressed as inches of water per inch of soil. The capacity, in inches, in a 60-inch profile or to a limiting layer is expressed as:

Very low	0 to 3
Low	3 to 6
Moderate	6 to 9
High	9 to 12
Very high	more than 12

Backslope. The geomorphic component that forms the steepest inclined surface and principal element of many hillsides. Backslopes in profile are commonly steep, are linear, and may or may not include cliff segments.

Base saturation. The degree to which material having cation-exchange properties is saturated with exchangeable bases (sum of Ca, Mg, Na, and K), expressed as a percentage of the total cation-exchange capacity.

Bedding planes. Fine strata, less than 5 millimeters thick, in unconsolidated alluvial, eolian, lacustrine, or marine sediment.

Bedding system. A drainage system made by plowing, grading, or otherwise shaping

the surface of a flat field. It consists of a series of low ridges separated by shallow, parallel dead furrows.

Bedrock. The solid rock that underlies the soil and other unconsolidated material or that is exposed at the surface.

Bedrock-controlled topography. A landscape where the configuration and relief of the landforms are determined or strongly influenced by the underlying bedrock.

Bottom land. The normal flood plain of a stream, subject to flooding.

Boulders. Rock fragments larger than 2 feet (60 centimeters) in diameter.

Brush management. Use of mechanical, chemical, or biological methods to make conditions favorable for reseeding or to reduce or eliminate competition from woody vegetation and thus allow understory grasses and forbs to recover. Brush management increases forage production and thus reduces the hazard of erosion. It can improve the habitat for some species of wildlife.

Calcareous soil. A soil containing enough calcium carbonate (commonly combined with magnesium carbonate) to effervesce visibly when treated with cold, dilute hydrochloric acid.

Canopy. The leafy crown of trees or shrubs. (See Crown.)

Capillary water. Water held as a film around soil particles and in tiny spaces between particles. Surface tension is the adhesive force that holds capillary water in the soil.

Catena. A sequence, or "chain," of soils on a landscape that formed in similar kinds of parent material but have different characteristics as a result of differences in relief and drainage.

Cation. An ion carrying a positive charge of electricity. The common soil cations are calcium, potassium, magnesium, sodium, and hydrogen.

Cation-exchange capacity. The total amount of exchangeable cations that can be held by the soil, expressed in terms of milliequivalents per 100 grams of soil at neutrality (pH 7.0) or at some other stated pH value. The term, as applied to soils, is synonymous with base-exchange capacity but is more precise in meaning.

Chemical treatment. Control of unwanted vegetation through the use of chemicals.

Chiseling. Tillage with an implement having one or more soil-penetrating points that shatter or loosen hard, compacted layers to a depth below normal plow depth.

Clay. As a soil separate, the mineral soil particles less than 0.002 millimeter in diameter. As a soil textural class, soil material that is 40 percent or more clay, less than 45 percent sand, and less than 40 percent silt.

Clay depletions. Low-chroma zones having a low content of iron, manganese, and clay because of the chemical reduction of iron and manganese and the removal of iron, manganese, and clay. A type of redoximorphic depletion.

Clay film. A thin coating of oriented clay on the surface of a soil aggregate or lining pores or root channels. Synonyms: clay coating, clay skin.

Claypan. A slowly permeable soil horizon that contains much more clay than the horizons above it. A claypan is commonly hard when dry and plastic or stiff when wet.

Climax plant community. The stabilized plant community on a particular site. The plant cover reproduces itself and does not change so long as the environment remains the same.

Coarse textured soil. Sand or loamy sand.

Cobble (or cobblestone). A rounded or partly rounded fragment of rock 3 to 10 inches (7.6 to 25 centimeters) in diameter.

Cobbly soil material. Material that is 15 to 35 percent, by volume, rounded or partially rounded rock fragments 3 to 10 inches (7.6 to 25 centimeters) in diameter. Very cobbly soil material has 35 to 60 percent of these rock fragments, and extremely cobbly soil material has more than 60 percent.

- Colluvium.** Soil material or rock fragments, or both, moved by creep, slide, or local wash and deposited at the base of steep slopes.
- Complex slope.** Irregular or variable slope. Planning or establishing terraces, diversions, and other water-control structures on a complex slope is difficult.
- Complex, soil.** A map unit of two or more kinds of soil or miscellaneous areas in such an intricate pattern or so small in area that it is not practical to map them separately at the selected scale of mapping. The pattern and proportion of the soils or miscellaneous areas are somewhat similar in all areas.
- Compressible** (in tables). Excessive decrease in volume of soft soil under load.
- Concretions.** Cemented bodies with crude internal symmetry organized around a point, a line, or a plane. They typically take the form of concentric layers visible to the naked eye. Calcium carbonate, iron oxide, and manganese oxide are common compounds making up concretions. If formed in place, concretions of iron oxide or manganese oxide are generally considered a type of redoximorphic concentration.
- Conservation cropping system.** Growing crops in combination with needed cultural and management practices. In a good conservation cropping system, the soil-improving crops and practices more than offset the effects of the soil-depleting crops and practices. Cropping systems are needed on all tilled soils. Soil-improving practices in a conservation cropping system include the use of rotations that contain grasses and legumes and the return of crop residue to the soil. Other practices include the use of green manure crops of grasses and legumes, proper tillage, adequate fertilization, and weed and pest control.
- Conservation tillage.** A tillage system that does not invert the soil and that leaves a protective amount of crop residue on the surface throughout the year.
- Consistence, soil.** Refers to the degree of cohesion and adhesion of soil material and its resistance to deformation when ruptured. Consistence includes resistance of soil material to rupture and to penetration; plasticity, toughness, and stickiness of puddled soil material; and the manner in which the soil material behaves when subject to compression. Terms describing consistence are defined in the "Soil Survey Manual."
- Contour stripcropping.** Growing crops in strips that follow the contour. Strips of grass or close-growing crops are alternated with strips of clean-tilled crops or summer fallow.
- Control section.** The part of the soil on which classification is based. The thickness varies among different kinds of soil, but for many it is that part of the soil profile between depths of 10 inches and 40 or 80 inches.
- Corrosion.** Soil-induced electrochemical or chemical action that dissolves or weakens concrete or uncoated steel.
- Cover crop.** A close-growing crop grown primarily to improve and protect the soil between periods of regular crop production, or a crop grown between trees and vines in orchards and vineyards.
- Cropping system.** Growing crops according to a planned system of rotation and management practices.
- Crop residue management.** Returning crop residue to the soil, which helps to maintain soil structure, organic matter content, and fertility and helps to control erosion.
- Crown.** The upper part of a tree or shrub, including the living branches and their foliage.
- Cutbanks cave** (in tables). The walls of excavations tend to cave in or slough.
- Decreasers.** The most heavily grazed climax range plants. Because they are the most palatable, they are the first to be destroyed by overgrazing.
- Deferred grazing.** Postponing grazing or resting grazing land for a prescribed period.
- Delta.** A body of alluvium having a surface that is nearly flat and fan shaped; deposited

at or near the mouth of a river or stream where it enters a body of relatively quiet water, generally a sea or lake.

Dense layer (in tables). A very firm, massive layer that has a bulk density of more than 1.8 grams per cubic centimeter. Such a layer affects the ease of digging and can affect filling and compacting.

Depth, soil. Generally, the thickness of the soil over bedrock. Very deep soils are more than 60 inches deep over bedrock; deep soils, 40 to 60 inches; moderately deep soils, 20 to 40 inches; shallow soils, 10 to 20 inches; and very shallow soils, less than 10 inches.

Depth to rock (in tables). Bedrock is too near the surface for the specified use.

Diversion (or diversion terrace). A ridge of earth, generally a terrace, built to protect downslope areas by diverting runoff from its natural course.

Drainage class (natural). Refers to the frequency and duration of wet periods under conditions similar to those under which the soil formed. Alterations of the water regime by human activities, either through drainage or irrigation, are not a consideration unless they have significantly changed the morphology of the soil. Seven classes of natural soil drainage are recognized—*excessively drained*, *somewhat excessively drained*, *well drained*, *moderately well drained*, *somewhat poorly drained*, *poorly drained*, and *very poorly drained*. These classes are defined in the “Soil Survey Manual.”

Eluviation. The movement of material in true solution or colloidal suspension from one place to another within the soil. Soil horizons that have lost material through eluviation are eluvial; those that have received material are illuvial.

Endosaturation. A type of saturation of the soil in which all horizons between the upper boundary of saturation and a depth of 2 meters are saturated.

Ephemeral stream. A stream, or reach of a stream, that flows only in direct response to precipitation. It receives no long-continued supply from melting snow or other source, and its channel is above the water table at all times.

Episaturation. A type of saturation indicating a perched water table in a soil in which saturated layers are underlain by one or more unsaturated layers within 2 meters of the surface.

Erosion. The wearing away of the land surface by water, wind, ice, or other geologic agents and by such processes as gravitational creep.

Erosion (geologic). Erosion caused by geologic processes acting over long geologic periods and resulting in the wearing away of mountains and the building up of such landscape features as flood plains and coastal plains. Synonym: natural erosion.

Erosion (accelerated). Erosion much more rapid than geologic erosion, mainly as a result of human or animal activities or of a catastrophe in nature, such as a fire, that exposes the surface.

Excess fines (in tables). Excess silt and clay in the soil. The soil does not provide a source of gravel or sand for construction purposes.

Fallow. Cropland left idle in order to restore productivity through accumulation of moisture. Summer fallow is common in regions of limited rainfall where cereal grain is grown. The soil is tilled for at least one growing season for weed control and decomposition of plant residue.

Fast intake (in tables). The rapid movement of water into the soil.

Fertility, soil. The quality that enables a soil to provide plant nutrients, in adequate amounts and in proper balance, for the growth of specified plants when light, moisture, temperature, tilth, and other growth factors are favorable.

Field moisture capacity. The moisture content of a soil, expressed as a percentage of the oven-dry weight, after the gravitational, or free, water has drained away; the field moisture content 2 or 3 days after a soaking rain; also called *normal field capacity*, *normal moisture capacity*, or *capillary capacity*.

Fine textured soil. Sandy clay, silty clay, or clay.

First bottom. The normal flood plain of a stream, subject to frequent or occasional flooding.

Flood plain. A nearly level alluvial plain that borders a stream and is subject to flooding unless protected artificially.

Fluvial. Of or pertaining to rivers; produced by river action, as a fluvial plain.

Footslope. The inclined surface at the base of a hill.

Forb. Any herbaceous plant not a grass or a sedge.

Genesis, soil. The mode of origin of the soil. Refers especially to the processes or soil-forming factors responsible for the formation of the solum, or true soil, from the unconsolidated parent material.

Gilgai. Commonly, a succession of microbasins and microknolls in nearly level areas or of microvalleys and microridges parallel with the slope. Typically, the microrelief of clayey soils that shrink and swell considerably with changes in moisture content.

Gleyed soil. Soil that formed under poor drainage, resulting in the reduction of iron and other elements in the profile and in gray colors.

Grassed waterway. A natural or constructed waterway, typically broad and shallow, seeded to grass as protection against erosion. Conducts surface water away from cropland.

Gravel. Rounded or angular fragments of rock as much as 3 inches (2 millimeters to 7.6 centimeters) in diameter. An individual piece is a pebble.

Gravelly soil material. Material that is 15 to 35 percent, by volume, rounded or angular rock fragments, not prominently flattened, as much as 3 inches (7.6 centimeters) in diameter.

Green manure crop (agronomy). A soil-improving crop grown to be plowed under in an early stage of maturity or soon after maturity.

Ground water. Water filling all the unblocked pores of the material below the water table.

Gully. A miniature valley with steep sides cut by running water and through which water ordinarily runs only after rainfall. The distinction between a gully and a rill is one of depth. A gully generally is an obstacle to farm machinery and is too deep to be obliterated by ordinary tillage; a rill is of lesser depth and can be smoothed over by ordinary tillage.

Hard bedrock. Bedrock that cannot be excavated except by blasting or by the use of special equipment that is not commonly used in construction.

Hardpan. A hardened or cemented soil horizon, or layer. The soil material is sandy, loamy, or clayey and is cemented by iron oxide, silica, calcium carbonate, or other substance.

High-residue crops. Such crops as small grain and corn used for grain. If properly managed, residue from these crops can be used to control erosion until the next crop in the rotation is established. These crops return large amounts of organic matter to the soil.

Horizon, soil. A layer of soil, approximately parallel to the surface, having distinct characteristics produced by soil-forming processes. In the identification of soil horizons, an uppercase letter represents the major horizons. Numbers or lowercase letters that follow represent subdivisions of the major horizons. An explanation of the subdivisions is given in the "Soil Survey Manual." The major horizons of mineral soil are as follows:

O horizon.—An organic layer of fresh and decaying plant residue.

A horizon.—The mineral horizon at or near the surface in which an accumulation of humified organic matter is mixed with the mineral material. Also, a plowed surface horizon, most of which was originally part of a B horizon.

E horizon.—The mineral horizon in which the main feature is loss of silicate clay, iron, aluminum, or some combination of these.

B horizon.—The mineral horizon below an A, O, or E horizon. The B horizon is in part a layer of transition from the overlying horizon to the underlying C horizon. The B horizon also has distinctive characteristics, such as (1) accumulation of clay, sesquioxides, humus, or a combination of these; (2) prismatic or blocky structure; (3) redder or browner colors than those in the A horizon; or (4) a combination of these.

C horizon.—The mineral horizon or layer, excluding indurated bedrock, that is little affected by soil-forming processes and does not have the properties typical of the overlying soil material. The material of a C horizon may be either like or unlike that in which the solum formed. If the material is known to differ from that in the solum, an Arabic numeral, commonly a 2, precedes the letter C.

Cr horizon.—Soft, consolidated bedrock beneath the soil.

R layer.—Consolidated bedrock beneath the soil. The bedrock commonly underlies a C horizon, but it can be directly below an A or a B horizon.

Humus. The well decomposed, more or less stable part of the organic matter in mineral soils.

Hydrologic soil groups. Refers to soils grouped according to their runoff potential.

The soil properties that influence this potential are those that affect the minimum rate of water infiltration on a bare soil during periods after prolonged wetting when the soil is not frozen. These properties are depth to a seasonal high water table, the infiltration rate and permeability after prolonged wetting, and depth to a very slowly permeable layer. The slope and the kind of plant cover are not considered but are separate factors in predicting runoff.

Illuviation. The movement of soil material from one horizon to another in the soil profile. Generally, material is removed from an upper horizon and deposited in a lower horizon.

Impervious soil. A soil through which water, air, or roots penetrate slowly or not at all. No soil is absolutely impervious to air and water all the time.

Increasers. Species in the climax vegetation that increase in amount as the more desirable plants are reduced by close grazing. Increasers commonly are the shorter plants and the less palatable to livestock.

Infiltration. The downward entry of water into the immediate surface of soil or other material, as contrasted with percolation, which is movement of water through soil layers or material.

Infiltration capacity. The maximum rate at which water can infiltrate into a soil under a given set of conditions.

Infiltration rate. The rate at which water penetrates the surface of the soil at any given instant, usually expressed in inches per hour. The rate can be limited by the infiltration capacity of the soil or the rate at which water is applied at the surface.

Intake rate. The average rate of water entering the soil under irrigation. Most soils have a fast initial rate; the rate decreases with application time. Therefore, intake rate for design purposes is not a constant but is a variable depending on the net irrigation application. The rate of water intake, in inches per hour, is expressed as follows:

Less than 0.2	very low
0.2 to 0.4	low
0.4 to 0.75	moderately low
0.75 to 1.25	moderate
1.25 to 1.75	moderately high
1.75 to 2.5	high
More than 2.5	very high

Intermittent stream. A stream, or reach of a stream, that flows for prolonged periods only when it receives ground-water discharge or long, continued contributions from melting snow or other surface and shallow subsurface sources.

Invaders. On range, plants that encroach into an area and grow after the climax vegetation has been reduced by grazing. Generally, plants invade following disturbance of the surface.

Iron depletions. Low-chroma zones having a low content of iron and manganese oxide because of chemical reduction and removal, but having a clay content similar to that of the adjacent matrix. A type of redoximorphic depletion.

Irrigation. Application of water to soils to assist in production of crops. Methods of irrigation are:

Controlled flooding.—Water is released at intervals from closely spaced field ditches and distributed uniformly over the field.

Drip (or trickle).—Water is applied slowly and under low pressure to the surface of the soil or into the soil through such applicators as emitters, porous tubing, or perforated pipe.

Furrow.—Water is applied in small ditches made by cultivation implements. Furrows are used for tree and row crops.

Sprinkler.—Water is sprayed over the soil surface through pipes or nozzles from a pressure system.

Knoll. A small, low, rounded hill rising above adjacent landforms.

Lamella. A thin, discontinuous or continuous, generally horizontal layer of fine material (especially clay and iron oxides) that has been illuviated within a coarser, eluviated layer.

Large stones (in tables). Rock fragments 3 inches (7.6 centimeters) or more across. Large stones adversely affect the specified use of the soil.

Leaching. The removal of soluble material from soil or other material by percolating water.

Liquid limit. The moisture content at which the soil passes from a plastic to a liquid state.

Loam. Soil material that is 7 to 27 percent clay particles, 28 to 50 percent silt particles, and less than 52 percent sand particles.

Low-residue crops. Such crops as corn used for silage, peas, beans, and potatoes. Residue from these crops is not adequate to control erosion until the next crop in the rotation is established. These crops return little organic matter to the soil.

Low strength. The soil is not strong enough to support loads.

Masses. Concentrations of substances in the soil matrix that do not have a clearly defined boundary with the surrounding soil material and cannot be removed as a discrete unit. Common compounds making up masses are calcium carbonate, gypsum or other soluble salts, iron oxide, and manganese oxide. Masses consisting of iron oxide or manganese oxide generally are considered a type of redoximorphic concentration.

Mechanical treatment. Use of mechanical equipment for seeding, brush management, and other management practices.

Medium textured soil. Very fine sandy loam, loam, silt loam, or silt.

Mineral soil. Soil that is mainly mineral material and low in organic material. Its bulk density is more than that of organic soil.

Minimum tillage. Only the tillage essential to crop production and prevention of soil damage.

Miscellaneous area. An area that has little or no natural soil and supports little or no vegetation.

Moderately coarse textured soil. Coarse sandy loam, sandy loam, or fine sandy loam.

Moderately fine textured soil. Clay loam, sandy clay loam, or silty clay loam.

Mollic epipedon. A thick, dark, humus-rich surface horizon (or horizons) that has high base saturation and pedogenic soil structure. It may include the upper part of the subsoil.

Morphology, soil. The physical makeup of the soil, including the texture, structure, porosity, consistence, color, and other physical, mineral, and biological properties of the various horizons, and the thickness and arrangement of those horizons in the soil profile.

Mottling, soil. Irregular spots of different colors that vary in number and size. Descriptive terms are as follows: abundance—*few*, *common*, and *many*; size—*fine*, *medium*, and *coarse*; and contrast—*faint*, *distinct*, and *prominent*. The size measurements are of the diameter along the greatest dimension. *Fine* indicates less than 5 millimeters (about 0.2 inch); *medium*, from 5 to 15 millimeters (about 0.2 to 0.6 inch); and *coarse*, more than 15 millimeters (about 0.6 inch).

Muck. Dark, finely divided, well decomposed organic soil material.

Mudstone. Sedimentary rock formed by induration of silt and clay in approximately equal amounts.

Munsell notation. A designation of color by degrees of three simple variables—hue, value, and chroma. For example, a notation of 10YR 6/4 is a color with hue of 10YR, value of 6, and chroma of 4.

Neutral soil. A soil having a pH value of 6.6 to 7.3. (See Reaction, soil.)

Nodules. Cemented bodies lacking visible internal structure. Calcium carbonate, iron oxide, and manganese oxide are common compounds making up nodules. If formed in place, nodules of iron oxide or manganese oxide are considered types of redoximorphic concentrations.

Nutrient, plant. Any element taken in by a plant essential to its growth. Plant nutrients are mainly nitrogen, phosphorus, potassium, calcium, magnesium, sulfur, iron, manganese, copper, boron, and zinc obtained from the soil and carbon, hydrogen, and oxygen obtained from the air and water.

Organic matter. Plant and animal residue in the soil in various stages of decomposition. The content of organic matter in the surface layer is described as follows:

Very low	less than 0.5 percent
Low	0.5 to 1.0 percent
Moderately low	1.0 to 2.0 percent
Moderate	2.0 to 4.0 percent
High	4.0 to 8.0 percent
Very high	more than 8.0 percent

Pan. A compact, dense layer in a soil that impedes the movement of water and the growth of roots. For example, *hardpan*, *fragipan*, *claypan*, *plowpan*, and *traffic pan*.

Parent material. The unconsolidated organic and mineral material in which soil forms.

Ped. An individual natural soil aggregate, such as a granule, a prism, or a block.

Pedon. The smallest volume that can be called “a soil.” A pedon is three dimensional and large enough to permit study of all horizons. Its area ranges from about 10 to 100 square feet (1 square meter to 10 square meters), depending on the variability of the soil.

Percolation. The downward movement of water through the soil.

Percolates slowly (in tables). The slow movement of water through the soil adversely affects the specified use.

Permeability. The quality of the soil that enables water or air to move downward through the profile. The rate at which a saturated soil transmits water is accepted as a measure of this quality. In soil physics, the rate is referred to as “saturated

hydraulic conductivity,” which is defined in the “Soil Survey Manual.” In line with conventional usage in the engineering profession and with traditional usage in published soil surveys, this rate of flow continues to be expressed as “permeability.” Terms describing permeability, measured in inches per hour, are as follows:

Very slow	less than .06 inch
Slow	0.06 to 0.2 inch
Moderately slow	0.2 to 0.6 inch
Moderate	0.6 inch to 2.0 inches
Moderately rapid	2.0 to 6.0 inches
Rapid	6.0 to 20 inches
Very rapid	more than 20 inches

Phase, soil. A subdivision of a soil series based on features that affect its use and management, such as slope, stoniness, and flooding.

pH value. A numerical designation of acidity and alkalinity in soil. (See Reaction, soil.)

Piping (in tables). Formation of subsurface tunnels or pipelike cavities by water moving through the soil.

Plasticity index. The numerical difference between the liquid limit and the plastic limit; the range of moisture content within which the soil remains plastic.

Plastic limit. The moisture content at which a soil changes from semisolid to plastic.

Pleistocene. Of, belonging to, or designating the geologic time, rock series, and sedimentary deposits of the earlier of the two epochs of the Quaternary Period.

Plowpan. A compacted layer formed in the soil directly below the plowed layer.

Ponding. Standing water on soils in closed depressions. Unless the soils are artificially drained, the water can be removed only by percolation or evapotranspiration.

Poor filter (in tables). Because of rapid or very rapid permeability, the soil may not adequately filter effluent from a waste disposal system.

Poorly graded. Refers to a coarse-grained soil or soil material consisting mainly of particles of nearly the same size. Because there is little difference in size of the particles, density can be increased only slightly by compaction.

Potential native plant community. See Climax plant community.

Potential rooting depth (effective rooting depth). Depth to which roots could penetrate if the content of moisture in the soil were adequate. The soil has no properties restricting the penetration of roots to this depth.

Prescribed burning. Deliberately burning an area for specific management purposes, under the appropriate conditions of weather and soil moisture and at the proper time of day.

Productivity, soil. The capability of a soil for producing a specified plant or sequence of plants under specific management.

Profile, soil. A vertical section of the soil extending through all its horizons and into the parent material.

Proper grazing use. Grazing at an intensity that maintains enough cover to protect the soil and maintain or improve the quantity and quality of the desirable vegetation. This practice increases the vigor and reproduction capacity of the key plants and promotes the accumulation of litter and mulch necessary to conserve soil and water.

Range condition. The present composition of the plant community on a range site in relation to the potential natural plant community for that site. Range condition is expressed as excellent, good, fair, or poor on the basis of how much the present plant community has departed from the potential.

Rangeland. Land on which the potential natural vegetation is predominantly grasses,

grasslike plants, forbs, or shrubs suitable for grazing or browsing. It includes natural grasslands, savannahs, many wetlands, some deserts, tundras, and areas that support certain forb and shrub communities.

Range site. An area of rangeland where climate, soil, and relief are sufficiently uniform to produce a distinct natural plant community. A range site is the product of all the environmental factors responsible for its development. It is typified by an association of species that differ from those on other range sites in kind or proportion of species or total production.

Reaction, soil. A measure of acidity or alkalinity of a soil, expressed in pH values. A soil that tests to pH 7.0 is described as precisely neutral in reaction because it is neither acid nor alkaline. The degrees of acidity or alkalinity, expressed as pH values, are:

Ultra acid	less than 3.5
Extremely acid	3.5 to 4.4
Very strongly acid	4.5 to 5.0
Strongly acid	5.1 to 5.5
Moderately acid	5.6 to 6.0
Slightly acid	6.1 to 6.5
Neutral	6.6 to 7.3
Slightly alkaline	7.4 to 7.8
Moderately alkaline	7.9 to 8.4
Strongly alkaline	8.5 to 9.0
Very strongly alkaline	9.1 and higher

Redoximorphic concentrations. Nodules, concretions, soft masses, pore linings, and other features resulting from the accumulation of iron or manganese oxide. An indication of chemical reduction and oxidation resulting from saturation.

Redoximorphic depletions. Low-chroma zones from which iron and manganese oxide or a combination of iron and manganese oxide and clay has been removed. These zones are indications of the chemical reduction of iron resulting from saturation.

Redoximorphic features. Redoximorphic concentrations, redoximorphic depletions, reduced matrices, a positive reaction to alpha,alpha-dipyridyl, and other features indicating the chemical reduction and oxidation of iron and manganese compounds resulting from saturation.

Reduced matrix. A soil matrix that has low chroma in situ because of chemically reduced iron (Fe II). The chemical reduction results from nearly continuous wetness. The matrix undergoes a change in hue or chroma within 30 minutes after exposure to air as the iron is oxidized (Fe III). A type of redoximorphic feature.

Relict stream terrace. One of a series of platforms in or adjacent to a stream valley that formed prior to the current stream system.

Relief. The elevations or inequalities of a land surface, considered collectively.

Residuum (residual soil material). Unconsolidated, weathered or partly weathered mineral material that accumulated as consolidated rock disintegrated in place.

Rill. A steep-sided channel resulting from accelerated erosion. A rill generally is a few inches deep and not wide enough to be an obstacle to farm machinery.

Road cut. A sloping surface produced by mechanical means during road construction. It is commonly on the uphill side of the road.

Rock fragments. Rock or mineral fragments having a diameter of 2 millimeters or more; for example, pebbles, cobbles, stones, and boulders.

Rooting depth (in tables). Shallow root zone. The soil is shallow over a layer that greatly restricts roots.

Root zone. The part of the soil that can be penetrated by plant roots.

- Runoff.** The precipitation discharged into stream channels from an area. The water that flows off the surface of the land without sinking into the soil is called surface runoff. Water that enters the soil before reaching surface streams is called ground-water runoff or seepage flow from ground water.
- Sand.** As a soil separate, individual rock or mineral fragments ranging from 0.05 millimeter to 2.0 millimeters in diameter. Most sand grains consist of quartz. As a soil textural class, a soil that is 85 percent or more sand and not more than 10 percent clay.
- Sandstone.** Sedimentary rock containing dominantly sand-sized particles.
- Saturation.** Wetness characterized by zero or positive pressure of the soil water. Under conditions of saturation, the water will flow from the soil matrix into an unlined auger hole.
- Second bottom.** The first terrace above the normal flood plain (or first bottom) of a river.
- Sedimentary rock.** Rock made up of particles deposited from suspension in water. The chief kinds of sedimentary rock are conglomerate, formed from gravel; sandstone, formed from sand; shale, formed from clay; and limestone, formed from soft masses of calcium carbonate. There are many intermediate types. Some wind-deposited sand is consolidated into sandstone.
- Seepage** (in tables). The movement of water through the soil. Seepage adversely affects the specified use.
- Sequum.** A sequence consisting of an illuvial horizon and the overlying eluvial horizon. (See Eluviation.)
- Series, soil.** A group of soils that have profiles that are almost alike, except for differences in texture of the surface layer. All the soils of a series have horizons that are similar in composition, thickness, and arrangement.
- Shale.** Sedimentary rock formed by induration of a clay, silty clay, or silty clay loam deposit and having the tendency to split into thin layers.
- Sheet erosion.** The removal of a fairly uniform layer of soil material from the land surface by the action of rainfall and surface runoff.
- Shrink-swell** (in tables). The shrinking of soil when dry and the swelling when wet. Shrinking and swelling can damage roads, dams, building foundations, and other structures. It can also damage plant roots.
- Silica.** A combination of silicon and oxygen. The mineral form is called quartz.
- Silt.** As a soil separate, individual mineral particles that range in diameter from the upper limit of clay (0.002 millimeter) to the lower limit of very fine sand (0.05 millimeter). As a soil textural class, soil that is 80 percent or more silt and less than 12 percent clay.
- Siltstone.** Sedimentary rock made up of dominantly silt-sized particles.
- Similar soils.** Soils that share limits of diagnostic criteria, behave and perform in a similar manner, and have similar conservation needs or management requirements for the major land uses in the survey area.
- Sinkhole.** A depression in the landscape where limestone has been dissolved.
- Slickensides.** Polished and grooved surfaces produced by one mass sliding past another. In soils, slickensides may occur at the bases of slip surfaces on the steeper slopes; on faces of blocks, prisms, and columns; and in swelling clayey soils, where there is marked change in moisture content.
- Slippage** (in tables). Soil mass susceptible to movement downslope when loaded, excavated, or wet.
- Slope.** The inclination of the land surface from the horizontal. Percentage of slope is the vertical distance divided by horizontal distance, then multiplied by 100. Thus, a slope of 20 percent is a drop of 20 feet in 100 feet of horizontal distance. In this survey, classes for simple slopes are as follows:

Soil Survey of Robertson County, Texas

Nearly level	0 to 1 percent
Very gently sloping	1 to 3 percent
Gently sloping	3 to 5 percent
Moderately sloping	5 to 8 percent
Strongly sloping	8 to 12 percent
Moderately steep	12 to 20 percent
Steep	20 to 45 percent
Very steep	45 percent and higher

Slope (in tables). Slope is great enough that special practices are required to ensure satisfactory performance of the soil for a specific use.

Slow intake (in tables). The slow movement of water into the soil.

Slow refill (in tables). The slow filling of ponds, resulting from restricted permeability in the soil.

Small stones (in tables). Rock fragments less than 3 inches (7.6 centimeters) in diameter. Small stones adversely affect the specified use of the soil.

Soft bedrock. Bedrock that can be excavated with trenching machines, backhoes, small rippers, and other equipment commonly used in construction.

Soil. A natural, three-dimensional body at the earth's surface. It is capable of supporting plants and has properties resulting from the integrated effect of climate and living matter acting on earthy parent material, as conditioned by relief over periods of time.

Soil separates. Mineral particles less than 2 millimeters in equivalent diameter and ranging between specified size limits. The names and sizes, in millimeters, of separates recognized in the United States are as follows:

Very coarse sand	2.0 to 1.0
Coarse sand	1.0 to 0.5
Medium sand	0.5 to 0.25
Fine sand	0.25 to 0.10
Very fine sand	0.10 to 0.05
Silt	0.05 to 0.002
Clay	less than 0.002

Solum. The upper part of a soil profile, above the C horizon, in which the processes of soil formation are active. The solum in soil consists of the A, E, and B horizons. Generally, the characteristics of the material in these horizons are unlike those of the material below the solum. The living roots and plant and animal activities are largely confined to the solum.

Stones. Rock fragments 10 to 24 inches (25 to 60 centimeters) in diameter if rounded or 15 to 24 inches (38 to 60 centimeters) in length if flat.

Stony. Refers to a soil containing stones in numbers that interfere with or prevent tillage.

Stripcropping. Growing crops in a systematic arrangement of strips or bands that provide vegetative barriers to wind erosion and water erosion.

Structure, soil. The arrangement of primary soil particles into compound particles or aggregates. The principal forms of soil structure are—*platy* (laminated), *prismatic* (vertical axis of aggregates longer than horizontal), *columnar* (prisms with rounded tops), *blocky* (angular or subangular), and *granular*. *Structureless* soils are either *single grain* (each grain by itself, as in dune sand) or *massive* (the particles adhering without any regular cleavage, as in many hardpans).

Stubble mulch. Stubble or other crop residue left on the soil or partly worked into the soil. It protects the soil from wind erosion and water erosion after harvest, during preparation of a seedbed for the next crop, and during the early growing period of the new crop.

Subsoil. Technically, the B horizon; roughly, the part of the solum below plow depth.

- Subsoiling.** Tilling a soil below normal plow depth, ordinarily to shatter a hardpan or claypan.
- Substratum.** The part of the soil below the solum.
- Subsurface layer.** Technically, the E horizon. Generally refers to a leached horizon lighter in color and lower in content of organic matter than the overlying surface layer.
- Summer fallow.** The tillage of uncropped land during the summer to control weeds and allow storage of moisture in the soil for the growth of a later crop. A practice common in semiarid regions, where annual precipitation is not enough to produce a crop every year. Summer fallow is frequently practiced before planting winter grain.
- Surface layer.** The soil ordinarily moved in tillage, or its equivalent in uncultivated soil, ranging in depth from 4 to 10 inches (10 to 25 centimeters). Frequently designated as the "plow layer," or the "Ap horizon."
- Surface soil.** The A, E, AB, and EB horizons, considered collectively. It includes all subdivisions of these horizons.
- Terrace.** An embankment, or ridge, constructed across sloping soils on the contour or at a slight angle to the contour. The terrace intercepts surface runoff so that water soaks into the soil or flows slowly to a prepared outlet. A terrace in a field generally is built so that the field can be farmed. A terrace intended mainly for drainage has a deep channel that is maintained in permanent sod.
- Terrace (geologic).** An old alluvial plain, ordinarily flat or undulating, bordering a river, a lake, or the sea.
- Texture, soil.** The relative proportions of sand, silt, and clay particles in a mass of soil. The basic textural classes, in order of increasing proportion of fine particles, are *sand, loamy sand, sandy loam, loam, silt loam, silt, sandy clay loam, clay loam, silty clay loam, sandy clay, silty clay,* and *clay*. The sand, loamy sand, and sandy loam classes may be further divided by specifying "coarse," "fine," or "very fine."
- Thin layer** (in tables). Otherwise suitable soil material that is too thin for the specified use.
- Tilth, soil.** The physical condition of the soil as related to tillage, seedbed preparation, seedling emergence, and root penetration.
- Toeslope.** The outermost inclined surface at the base of a hill; part of a footslope.
- Too arid** (in tables). The soil is dry most of the time, and vegetation is difficult to establish.
- Topsoil.** The upper part of the soil, which is the most favorable material for plant growth. It is ordinarily rich in organic matter and is used to topdress roadbanks, lawns, and land affected by mining.
- Toxicity** (in tables). Excessive amount of toxic substances, such as sodium or sulfur, that severely hinder establishment of vegetation or severely restrict plant growth.
- Trace elements.** Chemical elements, for example, zinc, cobalt, manganese, copper, and iron, in soils in extremely small amounts. They are essential to plant growth.
- Tuff.** A compacted deposit that is 50 percent or more volcanic ash and dust.
- Underlying material.** The part of the soil below the solum.
- Unstable fill** (in tables). There is a risk of caving or sloughing on banks of fill material.
- Upland.** Land at a higher elevation, in general, than the alluvial plain or stream terrace; land above the lowlands along streams.
- Valley fill.** In glaciated regions, material deposited in stream valleys by glacial meltwater. In nonglaciated regions, alluvium deposited by heavily loaded streams.
- Variegation.** Refers to patterns of contrasting colors assumed to be inherited from the parent material rather than to be the result of poor drainage.
- Weathering.** All physical and chemical changes produced in rocks or other deposits at or near the earth's surface by atmospheric agents. These changes result in disintegration and decomposition of the material.

Well graded. Refers to soil material consisting of coarse-grained particles that are well distributed over a wide range in size or diameter. Such soil normally can be easily increased in density and bearing properties by compaction. Contrasts with poorly graded soil.

Wilting point (or permanent wilting point). The moisture content of soil, on an oven-dry basis, at which a plant (specifically a sunflower) wilts so much that it does not recover when placed in a humid, dark chamber.

Tables

Soil Survey of Robertson County, Texas

Table 1.--Temperature and Precipitation
(Recorded in the period 1971-2000 at Franklin, Texas)

Month	Temperature						Precipitation				
	Average daily maximum	Average daily minimum	Average daily	2 years in 10 will have--		Average number of growing degree days*	Average	2 years in 10 will have--		Average number of days with 0.10 inch or more	Average snow- fall
				Maximum temp. higher than--	Minimum temp. lower than--			Less than--	More than--		
	<u>°F</u>	<u>°F</u>	<u>°F</u>	<u>°F</u>	<u>°F</u>	<u>Units</u>	<u>In</u>	<u>In</u>	<u>In</u>		<u>In</u>
January--	59.5	38.0	48.8	81	14	115	3.02	0.92	5.18	4	0.4
February--	64.2	42.1	53.1	85	17	167	2.86	0.93	4.78	4	0.4
March----	71.7	48.5	60.1	87	25	331	2.90	1.40	4.40	5	0.0
April----	77.9	55.2	66.5	90	34	494	3.03	1.27	4.83	4	0.0
May-----	84.2	63.4	73.8	94	46	738	4.81	1.99	7.78	6	0.0
June-----	90.5	69.6	80.0	100	55	895	2.80	0.94	4.73	5	0.0
July-----	95.1	71.9	83.5	104	62	1,039	2.03	0.53	3.30	3	0.0
August---	95.5	71.2	83.4	105	61	1,034	2.60	0.49	4.39	3	0.0
September	89.4	66.1	77.7	102	45	828	3.65	1.73	5.51	4	0.0
October--	80.5	56.8	68.6	94	35	579	4.38	1.39	6.79	5	0.0
November--	69.4	47.1	58.3	86	23	283	3.10	1.44	4.76	4	0.0
December--	61.4	40.0	50.7	81	15	135	3.52	1.37	5.39	5	0.0
Yearly: Average	78.3	55.8	67.1	---	---	---	---	---	---	---	---
Extreme	---	-1	---	106	10	---	---	---	---	---	---
Total--	---	---	---	---	---	6,638	38.70	31.18	45.23	52	0.9

* A growing degree day is a unit of heat available for plant growth. It can be calculated by adding the maximum and minimum daily temperatures, dividing the sum by 2, and subtracting the temperature below which growth is minimal for the principal crops in the area (50 degrees F).

Soil Survey of Robertson County, Texas

Table 2.—Freeze Dates in Spring and Fall
(Recorded in the period 1971-2000 at Franklin, Texas)

Probability	Temperature		
	24 °F or lower	28 °F or lower	32 °F or lower
Last freezing temperature in spring:			
1 year in 10 later than--	Mar. 3	Mar. 16	Apr. 3
2 years in 10 later than--	Feb. 23	Mar. 9	Mar. 26
5 years in 10 later than--	Feb. 3	Feb. 24	Mar. 12
First freezing temperature in fall:			
1 year in 10 earlier than--	Nov. 22	Nov. 14	Oct. 30
2 years in 10 earlier than--	Dec. 2	Nov. 21	Nov. 7
5 years in 10 earlier than--	Dec. 21	Dec. 4	Nov. 21

Table 3.—Growing Season
(Recorded in the period 1971-2000 at Franklin, Texas)

Probability	Daily minimum temperature during growing season		
	Higher than 24 °F	Higher than 28 °F	Higher than 32 °F
	<u>Days</u>	<u>Days</u>	<u>Days</u>
9 years in 10	275	253	221
8 years in 10	290	264	232
5 years in 10	324	284	254
2 years in 10	> 365	304	246
1 year in 10	> 365	314	287

Soil Survey of Robertson County, Texas

Table 4.—Acreage and Proportionate Extent of the Soils

Map symbol	Soil name	Acres	Percent
AaD	Arenosa fine sand, 1 to 8 percent slopes-----	2,813	0.5
BaB	Bastrop fine sandy loam, 1 to 3 percent slopes-----	2,863	0.5
BeB	Benchley clay loam, 1 to 3 percent slopes-----	7,289	1.3
BeC	Benchley clay loam, 3 to 5 percent slopes-----	1,007	0.2
BrB	Bremond fine sandy loam, 1 to 3 percent slopes-----	5,026	0.9
BsA	Bremond-Wilson complex, 0 to 1 percent slopes-----	3,721	0.7
BuA	Burleson clay, 0 to 1 percent slopes-----	1,066	0.2
CaA	Cadelake fine sandy loam, 0 to 2 percent slopes-----	922	0.2
ChC	Chazos loamy fine sand, 1 to 5 percent slopes-----	16,832	3.0
CoA	Coarsewood silt loam, 0 to 1 percent slopes, rarely flooded-----	2,250	0.4
CoB	Coarsewood silt loam, 1 to 3 percent slopes, rarely flooded-----	731	0.1
CrB	Crockett loam, 1 to 3 percent slopes-----	9,603	1.7
CrC2	Crockett loam, 2 to 5 percent slopes, eroded-----	6,035	1.1
DAM	Dam-----	68	*
DfC	Desan loamy fine sand, 1 to 5 percent slopes-----	1,465	0.3
DmB	Dimebox clay, 1 to 3 percent slopes-----	938	0.2
DuB	Dutek loamy fine sand, 1 to 3 percent slopes-----	6,275	1.1
DuD	Dutek loamy fine sand, 3 to 8 percent slopes-----	3,146	0.6
EdC	Edge fine sandy loam, 1 to 5 percent slopes-----	23,293	4.2
EdC2	Edge fine sandy loam, 2 to 5 percent slopes, eroded-----	20,449	3.7
EdD2	Edge fine sandy loam, 5 to 8 percent slopes, eroded-----	14,257	2.6
EgD	Edge-Gullied land complex, 3 to 8 percent slopes-----	3,860	0.7
EuC	Eufaula loamy fine sand, 1 to 5 percent slopes-----	18,770	3.4
Ga	Gaddy loamy fine sand, 0 to 2 percent slopes, frequently flooded-----	724	0.1
GsB	Gasil loamy fine sand, 1 to 5 percent slopes-----	22,392	4.0
GsD	Gasil loamy fine sand, 5 to 8 percent slopes-----	3,273	0.6
HaB	Hammond fine sandy loam, 1 to 3 percent slopes-----	1,040	0.2
HaE	Hammond fine sandy loam, 5 to 15 percent slopes-----	379	*
HeD	Hearne fine sandy loam, 3 to 8 percent slopes-----	15,600	2.8
HeE	Hearne fine sandy loam, 8 to 20 percent slopes-----	6,986	1.3
HnD	Hearne fine sandy loam, 1 to 8 percent slopes, graded-----	1,368	0.2
HnE	Hearne fine sandy loam, 5 to 20 percent slopes, very stony-----	2,125	0.4
HrD	Hearne gravelly fine sandy loam, 3 to 8 percent slopes-----	984	0.2
HsA	Highbank silty clay loam, 0 to 1 percent slopes, rarely flooded-----	5,596	1.0
LeC	Lexton clay loam, 3 to 5 percent slopes-----	1,603	0.3
LeE	Lexton clay loam, 5 to 12 percent slopes-----	1,211	0.2
LfA	Lufkin loam, 0 to 1 percent slopes-----	4,380	0.8
LuB	Luling clay, 1 to 3 percent slopes-----	3,613	0.7
LuC	Luling clay, 3 to 5 percent slopes-----	1,178	0.2
MgB	Margie fine sandy loam, 1 to 3 percent slopes-----	1,430	0.3
Na	Navasota clay, 0 to 1 percent slopes, frequently flooded-----	3,960	0.7
Nd	Navasota clay, 0 to 1 percent slopes, depressional-----	471	*
Ot	Oletha clay, 0 to 1 percent slopes, frequently flooded-----	2,333	0.4
PaC	Padina loamy fine sand, 1 to 5 percent slopes-----	34,136	6.2
PaE	Padina loamy fine sand, 5 to 15 percent slopes-----	7,155	1.3
Pt	Pits and Dumps-----	1,148	0.2
RaA	Rader fine sandy loam, 0 to 2 percent slopes-----	20,504	3.7
RoB	Robco loamy fine sand, 1 to 3 percent slopes-----	30,328	5.5
Rr	Roetex clay, 0 to 1 percent slopes, frequently flooded-----	1,158	0.2
RsC	Rosanky fine sandy loam, 2 to 5 percent slopes-----	13,555	2.4
RsD	Rosanky fine sandy loam, 5 to 8 percent slopes-----	1,332	0.2
RvC2	Rosanky fine sandy loam, 3 to 5 percent slopes, eroded-----	2,017	0.4
Sa	Sandow loam, 0 to 2 percent slopes, frequently flooded-----	11,789	2.1
ShA	Ships clay, 0 to 1 percent slopes, rarely flooded-----	26,729	4.8
ShB	Ships clay, 1 to 3 percent slopes, rarely flooded-----	1,261	0.2
Sk	Ships clay, 0 to 1 percent slopes, frequently flooded-----	5,478	1.0
SmC	Silawa loamy fine sand, 2 to 5 percent slopes-----	7,918	1.4
SmD	Silawa loamy fine sand, 5 to 8 percent slopes-----	3,068	0.6
SnB	Silstid loamy fine sand, 1 to 3 percent slopes-----	47,526	8.6

See footnote at end of table.

Soil Survey of Robertson County, Texas

Table 4.—Acreage and Proportionate Extent of the Soils—Continued

Map symbol	Soil name	Acres	Percent
SnD	Silstid loamy fine sand, 3 to 8 percent slopes-----	8,817	1.6
SpB	Spiller fine sandy loam, 1 to 3 percent slopes-----	1,282	0.2
TaA	Tabor fine sandy loam, 0 to 2 percent slopes-----	31,103	5.6
Uh	Uhland loam, 0 to 1 percent slopes, frequently flooded-----	18,815	3.4
W	Water-----	5,951	1.1
WeA	Weswood silt loam, 0 to 1 percent slopes, rarely flooded-----	7,297	1.3
WwA	Weswood silty clay loam, 0 to 1 percent slopes, rarely flooded-----	8,166	1.5
WwB	Weswood silty clay loam, 1 to 3 percent slopes, rarely flooded-----	1,811	0.3
Wx	Weswood-Yahola complex, 0 to 3 percent slopes, frequently flooded-----	1,131	0.2
Wy	Whitesboro clay loam, 0 to 1 percent slopes, frequently flooded-----	3,156	0.6
WzA	Wilson loam, 0 to 1 percent slopes-----	5,427	1.0
YaA	Yahola fine sandy loam, 0 to 2 percent slopes, rarely flooded-----	5,312	1.0
Zb	Zilaboy clay, 0 to 1 percent slopes, frequently flooded-----	7,052	1.3
	Total-----	553,747	100.0

* Less than 0.1 percent.

Table 5.—Land Capability and Yields per Acre of Crops and Pasture, Part I

(Yields in the "N" columns are for nonirrigated areas; those in the "I" columns are for irrigated areas. Yields are those that can be expected under a high level of management. Absence of a yield indicates that the soil is not suited to the crop or the crop generally is not grown on the soil)

Map symbol and soil name	Land capability		Bahagrass		Corn		Cotton lint		Grain sorghum		Improved bermudagrass	
	N	I	N	AUM	N	Bu	N	Lbs	N	Bu	N	AUM
AaD: Arenosa-----	4s	---	---	---	---	---	---	---	---	---	---	---
BaB: Bastrop-----	2e	---	---	---	65	---	350	---	55	---	7.0	---
BeB: Benchley-----	2e	---	7.0	---	90	---	450	---	85	---	8.0	---
BeC: Benchley-----	3e	---	7.0	---	75	---	250	---	65	---	8.0	---
BrB: Bremond-----	3e	---	---	---	70	---	400	---	70	---	6.0	---
BsA: Bremond----- Wilson-----	2w 3w	---	---	---	70	---	400	---	70	---	6.0	---
BuA: Burleson-----	2w	---	5.0	---	85	---	600	---	95	---	6.0	---
CaA: Cadelake-----	6w	---	---	---	---	---	---	---	---	---	---	---
ChC: Chazos-----	3e	---	6.0	---	55	---	---	---	45	---	7.0	---
CoA: Coarsewood-----	1	1	---	---	130	150	1,000	1,500.00	100	120.00	8.0	---
CoB: Coarsewood-----	2e	2e	---	---	110	130	800	1,000.00	90	100.00	8.0	---
CrB: Crockett-----	3e	---	5.0	---	55	---	300	---	55	---	6.5	---
CrC2: Crockett-----	4e	---	4.0	---	---	---	200.00	---	45	---	5.0	---
DAM. Dam			---	---	---	---	---	---	---	---	---	---

Table 5.—Land Capability and Yields per Acre of Crops and Pasture, Part I—Continued

Map symbol and soil name	Land capability		Bahagrass		Corn		Cotton lint		Grain sorghum		Improved bermudagrass	
	N	I	N	AUM	N	Bu	N	Lbs	N	Bu	N	AUM
DfC: Desan-----	3e	---	---	---	---	---	---	---	---	---	5.5	---
DmB: Dimebox-----	2e	---	5.0	---	100	---	625	---	85	---	6.0	---
DuB: Dutek-----	3s	---	5.0	---	---	---	---	---	40	---	7.0	---
DuD: Dutek-----	3e	---	4.5	---	---	---	---	---	30	---	6.5	---
EdC: Edge-----	4e	---	---	---	---	---	---	---	35	---	5.5	---
EdC2: Edge-----	4e	---	---	---	---	---	---	---	25	---	5.0	---
EdD2: Edge-----	6e	---	---	---	---	---	---	---	---	---	3.5	---
EgD: Edge-----	6e	---	---	---	---	---	---	---	---	---	3.5	---
7e Gullied land-----												
EuC: Eufaula-----	4s	---	---	---	---	---	---	---	20	---	3.5	---
Ga: Gaddy-----	5w	---	---	---	---	---	---	---	---	---	4.0	---
GsB: Gasil-----	3e	---	5.00	---	---	---	200	---	45	---	6.0	---
GsD: Gasil-----	4e	---	4.00	---	---	---	150	---	35	---	5.0	---
HaB: Hammond-----	3e	---	---	---	---	---	---	---	---	---	7.0	---
HaE: Hammond-----	6e	---	---	---	---	---	---	---	---	---	6.0	---
HeD: Hearne-----	4e	---	---	---	---	---	---	---	---	---	5.50	---

Table 5.—Land Capability and Yields per Acre of Crops and Pasture, Part I—Continued

Map symbol and soil name	Land capability		Bahia grass		Corn		Cotton lint		Grain sorghum		Improved bermudagrass	
	N	I	AUM	N	I	N	I	N	AUM	I	N	AUM
HeE: Hearne-----	6e	---	---	---	---	---	---	---	---	---	3.50	---
HnD: Hearne-----	6e	---	---	---	---	---	---	---	---	---	4.00	---
HnE: Hearne-----	7e	---	---	---	---	---	---	---	---	---	---	---
HrD: Hearne-----	4e	---	---	---	---	---	---	---	---	---	5.50	---
HsA: Highbank-----	2s	2s	---	100	120	750	1,600	100	120.00	---	8.00	---
LeC: Lexton-----	3e	---	---	---	---	---	---	---	---	---	8.00	---
LeE: Lexton-----	6e	---	6.0	---	---	---	---	---	---	---	7.00	---
LfA: Lufkin-----	3w	---	---	---	---	200	---	45	---	---	5.00	---
LuB: Luling-----	2e	---	5.0	110	---	700	---	100	---	---	6.00	---
LuC: Luling-----	3e	---	5.0	90	---	600	---	80	---	---	6.00	---
MGB: Margie-----	2e	---	6.0	50	---	300	---	50	---	---	7.00	---
Na: Navasota-----	5w	---	---	---	---	---	---	---	---	---	2.00	---
Nd: Navasota-----	6w	---	---	---	---	---	---	---	---	---	---	---
Ot: Oletha-----	5w	---	---	---	---	---	---	---	---	---	7.00	---
PaC: Padina-----	3e	---	---	---	---	---	---	---	---	---	7.0	---
PaE: Padina-----	6e	---	---	---	---	---	---	---	---	---	5.0	---

Table 5.—Land Capability and Yields per Acre of Crops and Pasture, Part I—Continued

Map symbol and soil name	Land capability		Bahagrass		Corn		Cotton lint		Grain sorghum		Improved bermudagrass	
	N	I	N	AUM	N	Bu	I	Lbs	N	Bu	N	AUM
Pt. Pits and Dumps				---		---		---		---		---
RaA: Rader-----	2e	---		6.0		60		200		70		7.0
RoB: Robco-----	2e	---		6.0		65		---		---		6.5
Rr: Roetex-----	7w	---		---		---		---		---		---
RSc: Rosanky-----	3e	---		---		60		250		45		7.0
RSD: Rosanky-----	4e	---		---		---		---		35		6.5
RvC2: Rosanky-----	4e	---		---		60		250		45		7.0
Sa: Sandow-----	5w	---		7.00		---		---		---		8.0
ShA: Ships-----	2s	2s		---		115		750		100		6.0
ShB: Ships-----	2e	2e		---		100		650		90		6.0
Sk: Ships-----	5w	---		---		---		---		---		5.0
SmC: Silawa-----	3e	---		5.0		55		350		50		6.0
SmD: Silawa-----	4e	---		5.0		---		---		---		5.0
SnB: Silstid-----	3s	---		6.0		---		---		40		8.0
SnD: Silstid-----	3e	---		6.0		---		---		30		7.0
SpB: Spiller-----	3e	---		6.0		---		---		---		7.5

Table 5.—Land Capability and Yields per Acre of Crops and Pasture, Part I—Continued

Map symbol and soil name	Land capability		Bahagrass		Corn		Cotton lint		Grain sorghum		Improved bermudagrass	
	N	I	N	AUM	N	Bu	N	Lbs	N	Bu	N	AUM
TaA: Tabor-----	3e	---	5.0	---	---	---	---	---	---	---	7.0	---
Uh: Uhland-----	5w	---	6.0	---	---	---	---	---	---	---	8.0	---
W. Water			---	---	---	---	---	---	---	---	---	---
WeA: Weswood-----	1	1	---	---	130	150	1,000	1,500	100	120.00	8.0	---
WwA: Weswood-----	1	1	---	---	130	150	1,000	1,500	100	120.00	8.0	---
WwB: Weswood-----	2e	2e	---	---	110	130	800	1,000	90	100.00	8.0	---
Wx: Weswood----- Yahola-----	5w 5w	--- ---	---	---	---	---	---	---	---	---	6.0	---
Wy: Whitesboro-----	5w	---	---	---	---	---	---	---	---	---	8.0	---
WzA: Wilson-----	3w	---	5.0	---	60	---	350	---	55	---	6.0	---
YaA: Yahola-----	2e	---	---	---	90	110	700	1,000	80	---	9.0	---
Zb: Zilaboy-----	5w	---	4.0	---	---	---	---	---	---	---	6.0	---

Soil Survey of Robertson County, Texas

Table 5.--Land Capability and Yields per Acre of Crops and Pasture, Part II

(Yields in the "N" columns are for nonirrigated areas; those in the "I" columns are for irrigated areas. Yields are those that can be expected under a high level of management. Absence of a yield indicates that the soil is not suited to the crop or the crop generally is not grown on the soil)

Map symbol and soil name	Land capability		Small grains grazeout		Soybeans		Wheat	
	N	I	N	I	N	I	N	I
			<u>AUM</u>	<u>AUM</u>	<u>Bu</u>	<u>Bu</u>	<u>Bu</u>	<u>Bu</u>
AaD: Arenosa-----	4s	---	---	---	---	---	---	---
BaB: Bastrop-----	2e	---	---	---	---	---	---	---
BeB: Benchley-----	2e	---	---	---	---	---	40	---
BeC: Benchley-----	3e	---	5.0	---	---	---	30	---
BrB: Bremond-----	3e	---	5.0	---	---	---	40	---
BsA: Bremond-----	2w	---	3.0	---	---	---	40	---
Wilson-----	3w	---						
BuA: Burleson-----	2w	---	4.0	---	---	---	40	---
CaA: Cadelake-----	6w	---	---	---	---	---	---	---
ChC: Chazos-----	3e	---	4.0	---	---	---	---	---
CoA: Coarsewood-----	1	1	5.0	---	30	45	45	---
CoB: Coarsewood-----	2e	2e	---	---	30	40	40	---
CrB: Crockett-----	3e	---	4.0	---		---	35	---
CrC2: Crockett-----	4e	---	3.0	---	---	---	20	---
DAM. Dam			---	---	---	---	---	---
DfC: Desan-----	3e	---	---	---	---	---	---	---
DmB: Dimebox-----	2e	---	4.00	---	---	---	---	---
DuB: Dutek-----	3s	---	---	---	---	---	---	---

Soil Survey of Robertson County, Texas

Table 5.—Land Capability and Yields per Acre of Crops and Pasture, Part II—Continued

Map symbol and soil name	Land capability		Small grains grazeout		Soybeans		Wheat	
	N	I	N	I	N	I	N	I
			<u>AUM</u>	<u>AUM</u>	<u>Bu</u>	<u>Bu</u>	<u>Bu</u>	<u>Bu</u>
DuD:								
Dutek-----	3e	---	---	---	---	---	---	---
EdC:								
Edge-----	4e	---	3.0	---	---	---	25	---
EdC2:								
Edge-----	4e	---	2.0	---	---	---	20	---
Edd2:								
Edge-----	6e	---	2.0	---	---	---	---	---
EgD:								
Edge-----	6e	---	---	---	---	---	---	---
Gullied land-----	7e	---						
EuC:								
Eufaula-----	4s	---	3.0	---	---	---	---	---
Ga:								
Gaddy-----	5w	---	---	---	---	---	---	---
GsB:								
Gasil-----	3e	---	5.0	---	---	---	25	---
GsD:								
Gasil-----	4e	---	4.0	---	---	---	15	---
HaB:								
Hammond-----	3e	---	---	---	---	---	---	---
HaE:								
Hammond-----	6e	---	---	---	---	---	---	---
HeD:								
Hearne-----	4e	---	---	---	---	---	---	---
HeE:								
Hearne-----	6e	---	---	---	---	---	---	---
HnD:								
Hearne-----	6e	---	---	---	---	---	---	---
HnE:								
Hearne-----	7e	---	---	---	---	---	---	---
HrD:								
Hearne-----	4e	---	---	---	---	---	---	---
HsA:								
Highbank-----	2s	2s	5.0	---	40	40	---	---
LeC:								
Lexton-----	3e	---	5.0	---	---	---	---	---
LeE:								
Lexton-----	6e	---	---	---	---	---	---	---

Soil Survey of Robertson County, Texas

Table 5.—Land Capability and Yields per Acre of Crops and Pasture, Part II—Continued

Map symbol and soil name	Land capability		Small grains grazeout		Soybeans		Wheat	
	N	I	N	I	N	I	N	I
			<u>AUM</u>	<u>AUM</u>	<u>Bu</u>	<u>Bu</u>	<u>Bu</u>	<u>Bu</u>
LfA: Lufkin-----	3w	---	---	---	---	---	---	---
LuB: Luling-----	2e	---	4.0	---	---	---	50	---
LuC: Luling-----	3e	---	3.0	---	---	---	45	---
MgB: Margie-----	2e	---	---	---	---	---	---	---
Na: Navasota-----	5w	---	---	---	---	---	---	---
Nd: Navasota-----	6w	---	---	---	---	---	---	---
Ot: Oletha-----	5w	---	---	---	---	---	---	---
PaC: Padina-----	3e	---	---	---	---	---	---	---
PaE: Padina-----	6e	---	---	---	---	---	---	---
Pt. Pits and Dumps			---	---	---	---	---	---
RaA: Rader-----	2e	---	---	---	---	---	30	---
RoB: Robco-----	2e	---	---	---	---	---	---	---
Rr: Roetex-----	7w	---	---	---	---	---	---	---
RsC: Rosanky-----	3e	---	---	---	---	---	30	---
RsD: Rosanky-----	4e	---	---	---	---	---	25	---
RvC2: Rosanky-----	4e	---	---	---	---	---	30	---
Sa: Sandow-----	5w	---	---	---	---	---	---	---
ShA: Ships-----	2s	2s	4.0	---	30	35	45	---
ShB: Ships-----	2e	2e	3.0	---	25	30	40	---
Sk: Ships-----	5w	---	---	---	---	---	---	---

Soil Survey of Robertson County, Texas

Table 5.—Land Capability and Yields per Acre of Crops and Pasture, Part II—Continued

Map symbol and soil name	Land capability		Small grains grazeout		Soybeans		Wheat	
	N	I	N	I	N	I	N	I
			<u>AUM</u>	<u>AUM</u>	<u>Bu</u>	<u>Bu</u>	<u>Bu</u>	<u>Bu</u>
SmC: Silawa-----	3e	---	---	---	---	---	---	---
SmD: Silawa-----	4e	---	---	---	---	---	---	---
SnB: Silstid-----	3s	---	---	---	---	---	---	---
SnD: Silstid-----	3e	---	---	---	---	---	---	---
SpB: Spiller-----	3e	---	---	---	---	---	---	---
TaA: Tabor-----	3e	---	---	---	---	---	---	---
Uh: Uhland-----	5w	---	---	---	---	---	---	---
W. Water			---	---	---	---	---	---
WeA: Weswood-----	1	1	6.00	---	30	45	45	---
WwA: Weswood-----	1	1	6.00	---	30	45	45	---
WwB: Weswood-----	2e	2e	6.00	---	30	40	40	---
Wx: Weswood-----	5w	---	---	---	---	---	---	---
Yahola-----	5w	---						
Wy: Whitesboro-----	5w	---	---	---	---	---	---	---
WzA: Wilson-----	3w	---	3.0	---	---	---	30.00	---
YaA: Yahola-----	2e	---	5.0	---	25	35	45.00	---
Zb: Zilaboy-----	5w	---	---	---	---	---	---	---

Soil Survey of Robertson County, Texas

Table 6.—Rangeland Productivity

(Only the soils that support rangeland vegetation suitable for grazing are rated)

Map symbol and soil name	Ecological site	Total dry-weight production		
		Favorable year	Normal year	Unfavorable year
		<u>Lb/acre</u>	<u>Lb/acre</u>	<u>Lb/acre</u>
AaD: Arenosa-----	Very Deep Sand	3,500	2,500	1,500
BaB: Bastrop-----	Sandy Loam	5,500	4,500	3,000
BeB: Benchley-----	Clay Loam	6,000	5,000	3,200
BeC: Benchley-----	Clay Loam	6,000	5,000	3,200
BrB: Bremond-----	Claypan Prairie	5,000	4,500	2,500
BsA: Bremond-----	Claypan Prairie	5,000	4,500	2,500
	Wilson-----	6,000	4,500	3,000
BuA: Burleson-----	Blackland	7,000	5,500	4,000
CaA: Cadelake-----	Wet Sandy Draw	4,500	4,000	3,500
ChC: Chazos-----	Sandy Loam	5,500	4,500	3,000
CoA: Coarsewood-----	Loamy Bottomland	8,000	6,500	5,000
CoB: Coarsewood-----	Loamy Bottomland	8,000	6,500	5,000
CrB: Crockett-----	Claypan Prairie	6,000	5,000	3,000
CrC2: Crockett-----	Claypan Prairie	6,000	5,000	3,000
DfC: Desan-----	Deep Sand	3,000	2,000	1,000
DmB: Dimebox-----	Blackland	7,000	6,000	4,500
DuB: Dutek-----	Sandy	4,500	4,000	2,000
DuD: Dutek-----	Sandy	4,500	4,000	2,000
EdC: Edge-----	Claypan Savannah	5,000	3,500	2,500

Soil Survey of Robertson County, Texas

Table 6.—Rangeland Productivity—Continued

Map symbol and soil name	Ecological site	Total dry-weight production		
		Favorable year	Normal year	Unfavorable year
		<u>Lb/acre</u>	<u>Lb/acre</u>	<u>Lb/acre</u>
EdC2: Edge-----	Claypan Savannah	4,400	3,100	2,200
EdD2: Edge-----	Claypan Savannah	4,400	3,100	2,200
EgD: Edge-----	Claypan Savannah	4,400	3,100	2,200
Gullied land.				
EuC: Eufaula-----	Deep Sand	4,000	2,800	2,000
Ga: Gaddy-----	Sandy Bottomland	3,800	2,700	2,000
GsB: Gasil-----	Sandy Loam	5,500	4,000	3,500
GsD: Gasil-----	Sandy Loam	5,500	4,000	3,500
HeD: Hearne-----	Sandy Loam	2,500	1,800	1,250
HeE: Hearne-----	Sandy Loam	2,500	1,800	1,250
HnD: Hearne-----	Sandstone Hill	2,500	1,800	1,250
HnE: Hearne-----	Sandstone Hill	2,500	1,800	1,250
HrD: Hearne-----	Sandy Loam	2,500	1,800	1,250
HsA: Highbank-----	Loamy Bottomland	8,000	6,500	5,000
LeC: Lexton-----	Deep Redland	3,000	2,200	1,700
LeE: Lexton-----	Deep Redland	3,000	2,200	1,700
LfA: Lufkin-----	Claypan Savannah	5,000	4,000	2,500
LuB: Luling-----	Blackland	7,000	4,500	3,000
LuC: Luling-----	Blackland	7,000	4,500	3,000
MgB: Margie-----	Deep Redland	6,000	4,500	3,000

Soil Survey of Robertson County, Texas

Table 6.—Rangeland Productivity—Continued

Map symbol and soil name	Ecological site	Total dry-weight production		
		Favorable year	Normal year	Unfavorable year
		<u>Lb/acre</u>	<u>Lb/acre</u>	<u>Lb/acre</u>
Na: Navasota-----	Clayey Bottomland	5,500	4,000	2,500
Nd: Navasota-----	Clayey Bottomland	5,500	4,000	2,500
Ot: Oletha-----	Clayey Bottomland	8,000	6,000	4,000
PaC: Padina-----	Deep Sand	4,500	3,500	2,250
PaE: Padina-----	Deep Sand	4,500	3,500	2,250
RaA: Rader-----	Sandy Loam	6,000	4,500	3,500
RoB: Robco-----	Sandy	3,600	3,000	2,600
Rr: Roetex-----	Clayey Bottomland	6,000	5,000	3,000
RsC: Rosanky-----	Sandy Loam	6,000	4,500	3,000
RsD: Rosanky-----	Sandy Loam	6,000	4,500	3,000
RvC2: Rosanky-----	Sandy Loam	6,000	4,500	3,000
Sa: Sandow-----	Loamy Bottomland	7,500	6,500	4,000
ShA: Ships-----	Clayey Bottomland	7,500	6,000	4,500
ShB: Ships-----	Clayey Bottomland	7,500	6,000	4,500
Sk: Ships-----	Clayey Bottomland	7,500	6,000	4,500
SmC: Silawa-----	Sandy Loam	5,500	4,500	2,500
SmD: Silawa-----	Sandy Loam	5,500	4,500	2,500
SnB: Silstid-----	Sandy	4,500	4,000	2,000
SnD: Silstid-----	Sandy	4,500	4,000	2,000
SpB: Spiller-----	Sandy Loam	6,000	4,500	3,000

Soil Survey of Robertson County, Texas

Table 6.—Rangeland Productivity—Continued

Map symbol and soil name	Ecological site	Total dry-weight production		
		Favorable year	Normal year	Unfavorable year
		<u>Lb/acre</u>	<u>Lb/acre</u>	<u>Lb/acre</u>
TaA: Tabor-----	Sandy Loam	6,500	5,500	3,500
Uh: Uhland-----	Loamy Bottomland	7,500	6,500	4,000
WeA: Weswood-----	Loamy Bottomland	8,000	6,500	5,000
WwA: Weswood-----	Loamy Bottomland	8,000	6,500	5,000
WwB: Weswood-----	Loamy Bottomland	8,000	6,500	5,000
Wx: Weswood-----	Loamy Bottomland	8,000	6,500	5,000
Yahola-----	Loamy Bottomland	7,500	5,500	4,000
Wy: Whitesboro-----	Loamy Bottomland	9,000	8,000	6,500
WzA: Wilson-----	Claypan Prairie	6,000	4,500	3,000
YaA: Yahola-----	Loamy Bottomland	7,500	5,500	4,000
Zb: Zilaboy-----	Clayey Bottomland	6,500	5,500	2,500

Soil Survey of Robertson County, Texas

Table 7.—Recreational Development

(The information in this table indicates the dominant soil condition but does not eliminate the need for onsite investigation. See text for definitions of terms used in this table. Absence of an entry indicates that no rating is applicable)

Map symbol and soil name	Camp areas	Picnic areas	Playgrounds	Paths and trails	Golf fairways
AaD: Arenosa-----	Severe: too sandy	Severe: too sandy	Severe: too sandy	Severe: too sandy	Severe: droughty
BaB: Bastrop-----	Slight	Slight	Moderate: slope	Slight	Slight
BeB: Benchley-----	Slight	Slight	Moderate: slope	Slight	Slight
BeC: Benchley-----	Slight	Slight	Moderate: slope	Slight	Slight
BrB: Bremond-----	Moderate: percs slowly	Moderate: percs slowly	Moderate: percs slowly slope	Slight	Slight
BsA: Bremond-----	Moderate: percs slowly	Moderate: percs slowly	Moderate: percs slowly	Slight	Slight
Wilson-----	Moderate: percs slowly	Moderate: percs slowly	Moderate: percs slowly small stones	Slight	Slight
BuA: Burleson-----	Moderate: percs slowly too clayey	Moderate: percs slowly too clayey	Moderate: too clayey	Moderate: too clayey	Severe: too clayey
CaA: Cadelake-----	Severe: wetness too acid	Severe: wetness too acid	Severe: wetness too acid	Severe: wetness	Severe: wetness too acid
ChC: Chazos-----	Slight	Slight	Moderate: slope small stones	Slight	Moderate: droughty
CoA: Coarsewood-----	Severe: flooding	Slight	Slight	Slight	Slight
CoB: Coarsewood-----	Severe: flooding	Slight	Slight	Slight	Slight
CrB: Crockett-----	Moderate: percs slowly	Moderate: percs slowly	Moderate: percs slowly slope	Severe: erodes easily	Moderate: droughty

Soil Survey of Robertson County, Texas

Table 7.—Recreational Development—Continued

Map symbol and soil name	Camp areas	Picnic areas	Playgrounds	Paths and trails	Golf fairways
CrC2: Crockett-----	Moderate: percs slowly	Moderate: percs slowly	Moderate: percs slowly slope	Severe: erodes easily	Moderate: droughty
DAM. Dam					
DfC: Desan-----	Moderate: too sandy	Moderate: too sandy	Moderate: slope too sandy	Moderate: too sandy	Moderate: droughty
DmB: Dimebox-----	Moderate: percs slowly too clayey	Moderate: percs slowly too clayey	Moderate: percs slowly slope too clayey	Moderate: too clayey	Severe: too clayey
DuB: Dutek-----	Moderate: too sandy	Moderate: too sandy	Moderate: slope too sandy	Moderate: too sandy	Moderate: droughty
DuD: Dutek-----	Moderate: too sandy	Moderate: too sandy	Moderate: slope too sandy	Moderate: too sandy	Moderate: droughty
EdC: Edge-----	Moderate: percs slowly	Moderate: percs slowly	Moderate: percs slowly slope	Severe: erodes easily	Slight
EdC2: Edge-----	Moderate: percs slowly	Moderate: percs slowly	Moderate: percs slowly slope	Severe: erodes easily	Slight
EdD2: Edge-----	Moderate: percs slowly	Moderate: percs slowly	Severe: slope	Severe: erodes easily	Slight
EgD: Edge-----	Moderate: percs slowly	Moderate: percs slowly	Moderate: percs slowly slope	Severe: erodes easily	Slight
Gullied land.					
EuC: Eufaula-----	Moderate: too sandy	Moderate: too sandy	Moderate: slope too sandy	Moderate: too sandy	Moderate: droughty
Ga: Gaddy-----	Severe: flooding	Moderate: flooding	Severe: flooding	Moderate: flooding	Severe: flooding
GsB: Gasil-----	Slight	Slight	Moderate: slope	Slight	Moderate: droughty

Soil Survey of Robertson County, Texas

Table 7.--Recreational Development--Continued

Map symbol and soil name	Camp areas	Picnic areas	Playgrounds	Paths and trails	Golf fairways
GsD: Gasil-----	Slight	Slight	Severe: slope	Slight	Moderate: droughty
HaB: Hammond-----	Slight	Slight	Moderate: slope	Slight	Slight
HaE: Hammond-----	Moderate: slope	Moderate: slope	Severe: slope	Slight	Moderate: slope
HeD: Hearne-----	Slight	Slight	Moderate: slope small stones	Slight	Moderate: droughty
HeE: Hearne-----	Moderate: slope	Moderate: slope	Severe: slope	Slight	Moderate: slope droughty
HnD: Hearne-----	Slight	Slight	Moderate: slope small stones	Slight	Moderate: droughty
HnE: Hearne-----	Moderate: large stones slope	Moderate: large stones slope	Severe: large stones slope small stones	Moderate: large stones	Moderate: large stones slope small stones
HrD: Hearne-----	Severe: small stones	Severe: small stones	Severe: small stones	Slight	Severe: small stones
HsA: Highbank-----	Severe: flooding	Slight	Slight	Slight	Slight
LeC: Lexton-----	Slight	Slight	Moderate: slope small stones	Slight	Slight
LeE: Lexton-----	Moderate: slope	Moderate: slope	Severe: slope	Slight	Moderate: slope
LfA: Lufkin-----	Moderate: percs slowly	Moderate: percs slowly	Moderate: percs slowly small stones	Slight	Moderate: droughty
LuB: Luling-----	Moderate: percs slowly too clayey	Moderate: percs slowly too clayey	Moderate: percs slowly slope too clayey	Moderate: too clayey	Severe: too clayey

Soil Survey of Robertson County, Texas

Table 7.--Recreational Development--Continued

Map symbol and soil name	Camp areas	Picnic areas	Playgrounds	Paths and trails	Golf fairways
LuC: Luling-----	Moderate: percs slowly too clayey	Moderate: percs slowly too clayey	Moderate: percs slowly slope too clayey	Moderate: too clayey	Severe: too clayey
MgB: Margie-----	Slight	Slight	Moderate: slope small stones	Slight	Moderate: droughty
Na: Navasota-----	Severe: flooding percs slowly wetness	Severe: percs slowly too clayey	Severe: flooding too clayey wetness	Severe: too clayey	Severe: flooding too clayey
Nd: Navasota-----	Severe: flooding percs slowly ponding	Severe: percs slowly too clayey ponding	Severe: flooding too clayey ponding	Severe: too clayey ponding	Severe: flooding too clayey ponding
Ot: Oletha-----	Severe: flooding	Moderate: flooding percs slowly too clayey	Severe: flooding	Moderate: flooding too clayey	Severe: flooding too clayey
PaC: Padina-----	Moderate: too sandy	Moderate: too sandy	Moderate: slope too sandy	Moderate: too sandy	Moderate: droughty
PaE: Padina-----	Moderate: slope too sandy	Moderate: slope too sandy	Severe: slope	Moderate: too sandy	Moderate: slope droughty
Pt. Pits and Dumps					
RaA: Rader-----	Moderate: percs slowly wetness	Moderate: percs slowly wetness	Moderate: percs slowly wetness	Slight	Slight
RoB: Robco-----	Moderate: too sandy wetness	Moderate: too sandy wetness	Moderate: slope small stones	Moderate: too sandy wetness	Moderate: wetness droughty
Rr: Roetex-----	Severe: flooding percs slowly ponding	Severe: percs slowly too clayey ponding	Severe: flooding too clayey ponding	Severe: too clayey ponding	Severe: flooding too clayey ponding
RsC: Rosanky-----	Slight	Slight	Moderate: slope small stones	Slight	Slight

Soil Survey of Robertson County, Texas

Table 7.—Recreational Development—Continued

Map symbol and soil name	Camp areas	Picnic areas	Playgrounds	Paths and trails	Golf fairways
RSD: Rosanky-----	Slight	Slight	Severe: slope	Slight	Slight
RvC2: Rosanky-----	Slight	Slight	Moderate: slope small stones	Slight	Slight
Sa: Sandow-----	Severe: flooding	Moderate: flooding	Severe: flooding	Moderate: flooding	Severe: flooding
ShA: Ships-----	Severe: flooding percs slowly too clayey	Severe: percs slowly too clayey	Severe: percs slowly too clayey	Severe: too clayey	Severe: too clayey
ShB: Ships-----	Severe: flooding percs slowly too clayey	Severe: percs slowly too clayey	Severe: percs slowly too clayey	Severe: too clayey	Severe: too clayey
Sk: Ships-----	Severe: flooding percs slowly too clayey	Severe: percs slowly too clayey	Severe: flooding percs slowly too clayey	Severe: too clayey	Severe: flooding too clayey
SmC: Silawa-----	Slight	Slight	Moderate: slope	Slight	Slight
SmD: Silawa-----	Slight	Slight	Severe: slope	Slight	Slight
SnB: Silstid-----	Moderate: too sandy	Moderate: too sandy	Moderate: slope small stones	Moderate: too sandy	Moderate: droughty
SnD: Silstid-----	Moderate: too sandy	Moderate: too sandy	Moderate: slope small stones	Moderate: too sandy	Moderate: droughty
SpB: Spiller-----	Slight	Slight	Moderate: slope	Slight	Slight
TaA: Tabor-----	Moderate: percs slowly	Moderate: percs slowly	Moderate: percs slowly small stones	Slight	Moderate: droughty
Uh: Uhland-----	Severe: flooding	Moderate: flooding wetness	Severe: flooding	Moderate: flooding	Severe: flooding

Soil Survey of Robertson County, Texas

Table 7.—Recreational Development—Continued

Map symbol and soil name	Camp areas	Picnic areas	Playgrounds	Paths and trails	Golf fairways
W. Water					
WeA: Weswood-----	Severe: flooding	Slight	Slight	Slight	Slight
WwA: Weswood-----	Severe: flooding	Slight	Slight	Slight	Slight
WwB: Weswood-----	Severe: flooding	Slight	Moderate: slope	Slight	Slight
Wx: Weswood-----	Severe: flooding	Moderate: flooding	Slight	Moderate: flooding	Severe: flooding
Yahola-----	Severe: flooding	Moderate: flooding	Severe: flooding	Moderate: flooding	Severe: flooding
Wy: Whitesboro-----	Severe: flooding	Moderate: flooding	Severe: flooding	Moderate: flooding	Severe: flooding
WzA: Wilson-----	Moderate: percs slowly	Moderate: percs slowly	Moderate: percs slowly small stones	Slight	Slight
YaA: Yahola-----	Severe: flooding	Slight	Slight	Slight	Slight
Zb: Zilaboy-----	Severe: flooding percs slowly wetness	Severe: percs slowly too clayey	Severe: flooding too clayey wetness	Severe: too clayey	Severe: flooding too clayey

Table 8.—Wildlife Habitat

(See text for definitions of terms used in this table. Absence of an entry indicates that no rating is applicable)

Map symbol and soil name	Potential for habitat elements							Potential as habitat for--			
	Grain and seed crops	Grasses herba- and legumes	Wild herba- ceous plants	Hard- wood trees	Shrubs	Wetland plants	Shallow water areas	Open- land wild- life	Wood- land wild- life	Wetland wild- life	Range- land wild- life
AaD: Arenosa-----	Poor	Poor	Fair	---	Fair	Very poor	Very poor	Poor	---	Very poor	Fair
BaB: Bastrop-----	Good	Good	Good	---	Good	Poor	Very poor	Good	---	Very poor	Good
BeB: Benchley-----	Good	Good	Fair	---	Fair	Very poor	Very poor	Fair	---	Very poor	Fair
BeC: Benchley-----	Good	Good	Fair	---	Fair	Very poor	Very poor	Fair	---	Very poor	Fair
BrB: Bremond-----	Fair	Good	Good	Good	Good	Poor	Poor	Good	---	Poor	Good
BsA: Bremond-----	Fair	Good	Good	Good	Good	Poor	Poor	Good	---	Poor	Good
Wilson-----	Fair	Fair	Good	---	Fair	Fair	Fair	Fair	---	Fair	Fair
BuA: Burleson-----	Good	Good	Poor	---	Poor	Very poor	Very poor	Fair	---	Very poor	Poor
CaA: Cadelake-----	Very poor	Poor	Fair	Fair	Fair	Fair	Good	Poor	---	Fair	Poor
ChC: Chazos-----	Fair	Good	Good	---	Good	Poor	Very poor	Good	---	Very poor	Good
CoA: Coarsewood-----	Good	Good	Good	Good	Good	Poor	Very poor	Good	---	Very poor	Good
CoB: Coarsewood-----	Good	Good	Good	Good	Good	Poor	Very poor	Good	---	Very poor	Good

Table 8.--Wildlife Habitat--Continued

Map symbol and soil name	Potential for habitat elements						Potential as habitat for--				
	Grain and seed crops	Grasses and legumes	Wild herba- ceous plants	Hard- wood trees	Shrubs	Wetland plants	Shallow water areas	Open- land wild- life	Wood- land wild- life	Wetland wild- life	Range- land wild- life
CrB: Crockett-----	Fair	Good	Good	Good	Good	Poor	Poor	Good	---	Poor	Good
Crc2: Crockett-----	Fair	Good	Good	Good	Good	Poor	Poor	Good	---	Poor	Good
DAM. Dam											
DfC: Desan-----	Fair	Good	Fair	---	Fair	Poor	Very poor	Fair	---	Very poor	Fair
DmB: Dimebox-----	Good	Good	Poor	---	Poor	Very poor	Very poor	Fair	---	Very poor	Poor
DuB: Dutek-----	Poor	Fair	Good	Fair	Good	Very poor	Very poor	Fair	Fair	Very poor	Good
DuD: Dutek-----	Poor	Fair	Good	Fair	Good	Very poor	Very poor	Fair	Fair	Very poor	Good
EdC: Edge-----	Fair	Fair	Good	Good	Good	Very poor	Very poor	Fair	Good	Very poor	Good
EdC2: Edge-----	Fair	Fair	Good	Good	Good	Very poor	Very poor	Fair	Good	Very poor	Good
EdD2: Edge-----	Poor	Fair	Good	Good	Good	Very poor	Very poor	Fair	Good	Very poor	Good
EgD: Edge-----	Poor	Fair	Good	Good	Good	Very poor	Very poor	Fair	Good	Very poor	Good
Gullied land-----	Poor	Fair	Poor	---	Poor	Very poor	Very poor	Poor	---	Very poor	Poor
EuC: Eufaula-----	Fair	Fair	Fair	---	Good	Very poor	Very poor	Fair	---	Very poor	Fair

Table 8.--Wildlife Habitat--Continued

Map symbol and soil name	Potential for habitat elements							Potential as habitat for--			
	Grain and seed crops	Grasses herba- and legumes	Wild herba- ceous plants	Hard- wood trees	Shrubs	Wetland plants	Shallow water areas	Open- land wild- life	Wood- land wild- life	Wetland wild- life	Range- land wild- life
Ga: Gaddy-----	Fair	Good	Good	Fair	Fair	Very poor	Very poor	Good	Fair	Very poor	Fair
GsB: Gasil-----	Fair	Good	Good	Fair	Good	Very poor	Very poor	Good	---	Very poor	Good
GsD: Gasil-----	Fair	Good	Good	Fair	Good	Very poor	Very poor	Good	---	Very poor	Good
HaB: Hammond-----	Fair	Good	Good	---	Fair	Poor	Poor	Good	---	Poor	Fair
HaE: Hammond-----	Poor	Fair	Good	---	Fair	Poor	Very poor	Fair	---	Very poor	Fair
HeD: Hearne-----	Fair	Good	Good	---	Good	Very poor	Very poor	Fair	---	Very poor	Good
HeE: Hearne-----	Fair	Good	Good	---	Good	Very poor	Very poor	Fair	---	Very poor	Good
HnD: Hearne-----	Poor	Fair	Good	---	Fair	Very poor	Very poor	Good	---	Very poor	Fair
HnE: Hearne-----	Poor	Fair	Good	---	Good	Very poor	Very poor	Fair	---	Very poor	Good
HrD: Hearne-----	Fair	Good	Good	---	Good	Very poor	Very poor	Fair	---	Very poor	Good
HsA: Highbank-----	Good	Good	Fair	---	Fair	Poor	Very poor	Good	---	Very poor	Fair
LeC: Lexton-----	Good	Good	Fair	Good	Fair	Poor	Very poor	Good	---	Very poor	Fair

Table 8.--Wildlife Habitat--Continued

Map symbol and soil name	Potential for habitat elements							Potential as habitat for--			
	Grain and seed crops	Grasses herba- and legumes plants	Wild herba- ceous plants	Hard- wood trees	Shrubs	Wetland plants	Shallow water areas	Open- land wild- life	Wood- land wild- life	Wetland wild- life	Range- land wild- life
LeE: Lexton-----	Fair	Good	Fair	Good	Fair	Very poor	Very poor	Fair	---	Very poor	Fair
LfA: Lufkin-----	Fair	Good	Fair	Good	---	Fair	Fair	Fair	Good	Fair	---
LuB: Luling-----	Good	Good	Poor	---	Fair	Poor	Very poor	Fair	---	Very poor	Poor
LuC: Luling-----	Fair	Good	Poor	---	Fair	Poor	Very poor	Fair	---	Very poor	Poor
MgB: Margie-----	Good	Good	Fair	Good	Fair	Poor	Very poor	Good	---	Very poor	Fair
Na: Navasota-----	Poor	Fair	Fair	Fair	---	Poor	Good	Fair	Fair	Fair	---
Nd: Navasota-----	Poor	Fair	Fair	Fair	---	Poor	Good	Fair	Fair	Fair	---
Ot: Oletha-----	Poor	Fair	Fair	Fair	---	Poor	Good	Fair	Fair	Fair	---
PaC: Padina-----	Fair	Good	Fair	---	Fair	Poor	Very poor	Fair	---	Very poor	Fair
PaE: Padina-----	Poor	Fair	Fair	---	Fair	Very poor	Very poor	Fair	---	Very poor	Fair
Pt: Pits and Dumps-----	Very poor	Very poor	Very poor	---	Very poor	Very poor	Very poor	Very poor	---	Very poor	Very poor
RaA: Rader-----	Fair	Good	Good	Good	Good	Poor	Poor	Good	---	Poor	Good
RoB: Robco-----	Fair	Fair	Good	---	Good	Poor	Very poor	Fair	---	Very poor	Good

Table 8.--Wildlife Habitat--Continued

Map symbol and soil name	Potential for habitat elements							Potential as habitat for--			
	Grain and seed crops	Grasses herba- and legumes	Wild herba- ceous plants	Hard- wood trees	Shrubs	Wetland plants	Shallow water areas	Open- land wild- life	Wood- land wild- life	Wetland wild- life	Range- land wild- life
Rr: Roetex-----	Very poor	Poor	Fair	---	Fair	Poor	Good	Poor	---	Fair	Fair
RSc: Rosanky-----	Fair	Good	Good	---	Fair	Poor	Very poor	Good	---	Very poor	Fair
RSD: Rosanky-----	Fair	Good	Good	---	Fair	Poor	Very poor	Good	---	Very poor	Fair
RvC2: Rosanky-----	Fair	Good	Good	---	Fair	Poor	Very poor	Good	---	Very poor	Fair
Sa: Sandow-----	Very poor	Poor	Good	Good	Good	Fair	Fair	Poor	Fair	Fair	Good
ShA: Ships-----	Good	Good	Fair	---	Fair	Poor	Poor	Good	---	Poor	Fair
ShB: Ships-----	Good	Good	Fair	---	Fair	Poor	Poor	Good	---	Poor	Fair
Sk: Ships-----	Very poor	Poor	Fair	---	Fair	Poor	Poor	Poor	---	Poor	Fair
SmC: Silawa-----	Fair	Good	Good	---	Good	Poor	Very poor	Good	---	Very poor	Good
SmD: Silawa-----	Fair	Good	Good	---	Good	Poor	Very poor	Good	---	Very poor	Good
SnB: Silstid-----	Poor	Poor	Fair	Poor	Good	Poor	Very poor	Poor	Poor	Very poor	Fair
SnD: Silstid-----	Poor	Poor	Fair	Poor	Good	Poor	Very poor	Poor	Poor	Very poor	Fair
SpB: Spiller-----	Good	Good	Good	Good	Good	Poor	Poor	Good	---	Poor	Good

Table 8.--Wildlife Habitat--Continued

Map symbol and soil name	Potential for habitat elements							Potential as habitat for--			
	Grain and seed crops	Grasses herba- and legumes plants	Wild ceous plants	Hard- wood trees	Shrubs	Wetland plants	Shallow water areas	Open- land wild- life	Wood- land wild- life	Wetland wild- life	Range- land wild- life
TaA: Tabor-----	Fair	Good	Good	---	Good	Very poor	Very poor	Good	---	Very poor	Good
Uh: Uhland-----	Poor	Fair	Fair	Good	Good	Fair	Fair	Fair	---	Fair	Fair
W. Water											
WeA: Weswood-----	Good	Good	Fair	---	Good	Poor	Very poor	Good	---	Very poor	Fair
WwA: Weswood-----	Good	Good	Fair	---	Good	Poor	Very poor	Good	---	Very poor	Fair
WwB: Weswood-----	Good	Good	Fair	---	Good	Poor	Very poor	Good	---	Very poor	Fair
Wx: Weswood-----	Poor	Good	Fair	---	Good	Poor	Very poor	Fair	---	Very poor	Fair
Yahola-----	Poor	Fair	Fair	Good	Good	Poor	Very poor	Fair	Good	Very poor	Fair
Wy: Whitesboro-----	Very poor	Poor	Fair	---	Fair	Poor	Poor	Poor	---	Poor	Fair
WzA: Wilson-----	Fair	Fair	Good	---	Fair	Fair	Fair	Fair	---	Fair	Fair
YaA: Yahola-----	Good	Good	Good	Good	Good	Poor	Very poor	Good	Good	Very poor	Good
Zb: Zilaboy-----	Fair	Fair	Fair	Good	---	Fair	Good	Fair	Good	Fair	---

Table 9.--Building Site Development

(The information in this table indicates the dominant soil condition but does not eliminate the need for onsite investigation. See text for definitions of terms used in this table. Absence of an entry indicates that no rating is applicable)

Map symbol and soil name	Shallow excavations	Dwellings without basements	Dwellings with basements	Small commercial buildings	Local roads and streets	Lawns and landscaping
AaD: Arenosa-----	Severe: cutbanks cave	Slight	Slight	Moderate: slope	Slight	Severe: droughty
BaB: Bastrop-----	Slight	Slight	Slight	Slight	Moderate: low strength	Slight
BeB: Benchley-----	Moderate: too clayey	Severe: shrink-swell	Severe: shrink-swell	Severe: shrink-swell	Severe: low strength shrink-swell	Slight
BeC: Benchley-----	Moderate: too clayey	Severe: shrink-swell	Severe: shrink-swell	Severe: shrink-swell	Severe: low strength shrink-swell	Slight
BrB: Bremond-----	Moderate: too clayey	Severe: shrink-swell	Severe: shrink-swell	Severe: shrink-swell	Severe: low strength shrink-swell	Slight
BsA: Bremond-----	Moderate: too clayey	Severe: shrink-swell	Severe: shrink-swell	Severe: shrink-swell	Severe: low strength shrink-swell	Slight
Wilson-----	Moderate: too clayey	Severe: shrink-swell	Severe: shrink-swell	Severe: shrink-swell	Severe: low strength shrink-swell	Slight
BuA: Burleson-----	Severe: cutbanks cave	Severe: shrink-swell	Severe: shrink-swell	Severe: shrink-swell	Severe: low strength shrink-swell	Severe: too clayey
CaA: Cadelake-----	Severe: wetness cutbanks cave	Severe: wetness	Severe: wetness	Severe: wetness	Severe: wetness	Severe: wetness too acid
ChC: Chazos-----	Moderate: too clayey	Moderate: shrink-swell	Moderate: shrink-swell	Moderate: shrink-swell	Severe: low strength	Moderate: droughty

Table 9.—Building Site Development—Continued

Map symbol and soil name	Shallow excavations	Dwellings without basements	Dwellings with basements	Small commercial buildings	Local roads and streets	Lawns and landscaping
CoA: Coarsewood-----	Slight	Severe: flooding	Severe: flooding	Severe: flooding	Moderate: flooding	Slight
CoB: Coarsewood-----	Slight	Severe: flooding	Severe: flooding	Severe: flooding	Moderate: flooding	Slight
CrB: Crockett-----	Moderate: too clayey	Severe: shrink-swell	Severe: shrink-swell	Severe: shrink-swell	Severe: low strength shrink-swell	Moderate: droughty
CrC2: Crockett-----	Moderate: too clayey	Severe: shrink-swell	Severe: shrink-swell	Severe: shrink-swell	Severe: low strength shrink-swell	Moderate: droughty
DAM. Dam						
DfC: Desan-----	Severe: cutbanks cave	Slight	Slight	Slight	Slight	Moderate: droughty
DmB: Dimebox-----	Severe: cutbanks cave	Severe: shrink-swell	Severe: shrink-swell	Severe: shrink-swell	Severe: low strength shrink-swell	Severe: too clayey
DuB: Dutek-----	Severe: cutbanks cave	Slight	Slight	Slight	Slight	Moderate: droughty
DuD: Dutek-----	Severe: cutbanks cave	Slight	Slight	Moderate: slope	Slight	Moderate: droughty
EdC: Edge-----	Moderate: too clayey	Severe: shrink-swell	Severe: shrink-swell	Severe: shrink-swell	Severe: low strength shrink-swell	Slight
EdC2: Edge-----	Moderate: too clayey	Severe: shrink-swell	Severe: shrink-swell	Severe: shrink-swell	Severe: low strength shrink-swell	Slight

Table 9.--Building Site Development--Continued

Map symbol and soil name	Shallow excavations	Dwellings without basements	Dwellings with basements	Small commercial buildings	Local roads and streets	Lawns and landscaping
Edd2: Edge-----	Moderate: too clayey	Severe: shrink-swell	Severe: shrink-swell	Severe: shrink-swell	Severe: low strength shrink-swell	Slight
EgD: Edge-----	Moderate: too clayey	Severe: shrink-swell	Severe: shrink-swell	Severe: shrink-swell	Severe: low strength shrink-swell	Slight
Gullied land.						
EuC: Eufaula-----	Severe: cutbanks cave	Slight	Slight	Slight	Slight	Moderate: droughty
Ga: Gaddy-----	Severe: cutbanks cave	Severe: flooding	Severe: flooding	Severe: flooding	Severe: flooding	Severe: flooding
GsB: Gasil-----	Slight	Slight	Slight	Slight	Slight	Moderate: droughty
GsD: Gasil-----	Slight	Slight	Slight	Moderate: slope	Slight	Moderate: droughty
HaB: Hammond-----	Slight	Moderate: shrink-swell	Moderate: shrink-swell	Moderate: shrink-swell	Severe: low strength	Slight
HaE: Hammond-----	Moderate: slope	Moderate: shrink-swell slope	Moderate: shrink-swell slope	Severe: slope	Severe: low strength	Moderate: slope
HeD: Hearne-----	Moderate: too clayey	Moderate: shrink-swell	Moderate: shrink-swell	Moderate: shrink-swell slope	Severe: low strength	Moderate: droughty
HeE: Hearne-----	Moderate: slope too clayey	Moderate: shrink-swell slope	Moderate: shrink-swell slope	Severe: slope	Severe: low strength	Moderate: slope droughty

Table 9.--Building Site Development--Continued

Map symbol and soil name	Shallow excavations	Dwellings without basements	Dwellings with basements	Small commercial buildings	Local roads and streets	Lawns and landscaping
HnD: Hearne-----	Moderate: too clayey	Moderate: shrink-swell	Moderate: shrink-swell	Moderate: shrink-swell slope	Severe: low strength	Moderate: droughty
HnE: Hearne-----	Moderate: slope too clayey	Moderate: shrink-swell slope	Moderate: shrink-swell slope	Severe: slope	Severe: low strength	Moderate: large stones slope small stones
HrD: Hearne-----	Moderate: too clayey	Moderate: shrink-swell	Moderate: shrink-swell	Moderate: shrink-swell slope	Severe: low strength	Severe: small stones
HsA: Highbank-----	Moderate: too clayey	Severe: flooding shrink-swell	Severe: flooding shrink-swell	Severe: flooding shrink-swell	Severe: low strength shrink-swell	Slight
LeC: Lexton-----	Moderate: too clayey	Moderate: shrink-swell	Moderate: shrink-swell	Moderate: shrink-swell slope	Severe: low strength	Slight
LeE: Lexton-----	Moderate: slope too clayey	Moderate: shrink-swell slope	Moderate: shrink-swell slope	Severe: slope	Severe: low strength	Moderate: slope
LfA: Lufkin-----	Moderate: too clayey	Severe: shrink-swell	Severe: shrink-swell	Severe: shrink-swell	Severe: low strength shrink-swell	Moderate: droughty
LuB: Luling-----	Severe: cutbanks cave	Severe: shrink-swell	Severe: shrink-swell	Severe: shrink-swell	Severe: low strength shrink-swell	Severe: too clayey
LuC: Luling-----	Severe: cutbanks cave	Severe: shrink-swell	Severe: shrink-swell	Severe: shrink-swell	Severe: low strength shrink-swell	Severe: too clayey
MgB: Margie-----	Moderate: too clayey	Moderate: shrink-swell	Moderate: shrink-swell	Moderate: shrink-swell	Severe: low strength	Moderate: droughty

Table 9.--Building Site Development--Continued

Map symbol and soil name	Shallow excavations	Dwellings without basements	Dwellings with basements	Small commercial buildings	Local roads and streets	Lawns and landscaping
Na: Navasota-----	Severe: wetness cutbanks cave	Severe: flooding shrink-swell wetness	Severe: flooding shrink-swell wetness	Severe: flooding shrink-swell wetness	Severe: flooding low strength shrink-swell	Severe: flooding too clayey
Nd: Navasota-----	Severe: ponding cutbanks cave	Severe: flooding shrink-swell ponding	Severe: flooding shrink-swell ponding	Severe: flooding shrink-swell ponding	Severe: low strength shrink-swell ponding	Severe: flooding too clayey ponding
Ot: Oiletha-----	Moderate: flooding wetness	Severe: flooding	Severe: flooding	Severe: flooding	Severe: flooding low strength	Severe: flooding too clayey
PaC: Padina-----	Severe: cutbanks cave	Slight	Slight	Slight	Slight	Moderate: droughty
PaE: Padina-----	Severe: cutbanks cave	Moderate: slope	Moderate: slope	Severe: slope	Moderate: slope	Moderate: slope droughty
Pt. Pits and Dumps						
RaA: Rader-----	Severe: wetness	Moderate: wetness	Severe: shrink-swell wetness	Moderate: wetness	Moderate: wetness	Slight
RoB: Robco-----	Severe: wetness cutbanks cave	Moderate: wetness	Severe: shrink-swell wetness	Moderate: wetness	Moderate: wetness	Moderate: wetness droughty
Rr: Roetex-----	Severe: ponding cutbanks cave	Severe: flooding shrink-swell ponding	Severe: flooding shrink-swell ponding	Severe: flooding shrink-swell ponding	Severe: low strength shrink-swell ponding	Severe: flooding too clayey ponding
RSC: Rosanky-----	Moderate: too clayey	Moderate: shrink-swell	Slight	Moderate: shrink-swell	Severe: low strength	Slight

Table 9.--Building Site Development--Continued

Map symbol and soil name	Shallow excavations	Dwellings without basements	Dwellings with basements	Small commercial buildings	Local roads and streets	Lawns and landscaping
RSD: Rosanky-----	Moderate: too clayey	Moderate: shrink-swell	Slight	Moderate: shrink-swell slope	Severe: low strength	Slight
RvC2: Rosanky-----	Moderate: too clayey	Moderate: shrink-swell	Slight	Moderate: shrink-swell slope	Severe: low strength	Slight
Sa: Sandow-----	Severe: cutbanks cave	Severe: flooding	Severe: flooding	Severe: flooding	Severe: flooding	Severe: flooding
ShA: Ships-----	Severe: cutbanks cave	Severe: flooding shrink-swell	Severe: flooding shrink-swell	Severe: flooding shrink-swell	Severe: low strength shrink-swell	Severe: too clayey
ShB: Ships-----	Severe: cutbanks cave	Severe: flooding shrink-swell	Severe: flooding shrink-swell	Severe: flooding shrink-swell	Severe: low strength shrink-swell	Severe: too clayey
Sk: Ships-----	Severe: cutbanks cave	Severe: flooding shrink-swell	Severe: flooding shrink-swell	Severe: flooding shrink-swell	Severe: flooding low strength shrink-swell	Severe: flooding too clayey
SmC: Silawa-----	Severe: cutbanks cave	Slight	Slight	Slight	Slight	Slight
SmD: Silawa-----	Severe: cutbanks cave	Slight	Slight	Moderate: slope	Slight	Slight
SnB: Silstid-----	Severe: cutbanks cave	Slight	Slight	Slight	Slight	Moderate: droughty
SnD: Silstid-----	Severe: cutbanks cave	Slight	Slight	Moderate: slope	Slight	Moderate: droughty
SpB: Spiller-----	Moderate: too clayey	Moderate: shrink-swell	Moderate: shrink-swell	Moderate: shrink-swell	Severe: low strength	Slight

Table 9.--Building Site Development--Continued

Map symbol and soil name	Shallow excavations	Dwellings without basements	Dwellings with basements	Small commercial buildings	Local roads and streets	Lawns and landscaping
TaA: Tabor-----	Moderate: too clayey	Severe: shrink-swell	Severe: shrink-swell	Severe: shrink-swell	Severe: low strength shrink-swell	Moderate: droughty
Uh: Uhland-----	Severe: wetness	Severe: flooding	Severe: flooding wetness	Severe: flooding	Severe: flooding	Severe: flooding
W. Water						
WeA: Weswood-----	Slight	Severe: flooding	Severe: flooding	Severe: flooding	Severe: low strength	Slight
WwA: Weswood-----	Slight	Severe: flooding	Severe: flooding	Severe: flooding	Severe: low strength	Slight
WwB: Weswood-----	Slight	Severe: flooding	Severe: flooding	Severe: flooding	Severe: low strength	Slight
Wx: Weswood-----	Moderate: flooding	Severe: flooding	Severe: flooding	Severe: flooding	Severe: flooding low strength	Severe: flooding
Yahola-----	Severe: cutbanks cave	Severe: flooding	Severe: flooding	Severe: flooding	Severe: flooding	Severe: flooding
Wy: Whitesboro-----	Moderate: flooding	Severe: flooding	Severe: flooding	Severe: flooding	Severe: flooding low strength	Severe: flooding
WzA: Wilson-----	Moderate: too clayey	Severe: shrink-swell	Severe: shrink-swell	Severe: shrink-swell	Severe: low strength shrink-swell	Slight
YaA: Yahola-----	Severe: cutbanks cave	Severe: flooding	Severe: flooding	Severe: flooding	Moderate: flooding	Slight

Table 9.--Building Site Development--Continued

Map symbol and soil name	Shallow excavations	Dwellings without basements	Dwellings with basements	Small commercial buildings	Local roads and streets	Lawns and landscaping
Zb: Zilaboy-----	Severe: wetness cutbanks cave	Severe: flooding shrink-swell wetness	Severe: flooding shrink-swell wetness	Severe: flooding shrink-swell wetness	Severe: flooding low strength shrink-swell	Severe: flooding too clayey

Soil Survey of Robertson County, Texas

Table 10.—Sanitary Facilities

(The information in this table indicates the dominant soil condition but does not eliminate the need for onsite investigation. See text for definitions of terms used in this table. Absence of an entry indicates that no rating is applicable)

Map symbol and soil name	Septic tank absorption fields	Sewage lagoon areas	Trench sanitary landfill	Area sanitary landfill	Daily cover for landfill
AaD: Arenosa-----	Severe: poor filter	Severe: seepage	Severe: seepage too sandy	Severe: seepage	Poor: seepage too sandy
BaB: Bastrop-----	Moderate: percs slowly	Severe: seepage	Moderate: too clayey	Slight	Fair: too clayey
BeB: Benchley-----	Severe: percs slowly	Moderate: slope	Severe: too clayey	Slight	Poor: hard to pack too clayey
BeC: Benchley-----	Severe: percs slowly	Moderate: slope	Severe: too clayey	Slight	Poor: hard to pack too clayey
BrB: Bremond-----	Severe: percs slowly	Moderate: slope	Severe: too clayey	Slight	Poor: hard to pack too clayey
BsA: Bremond-----	Severe: percs slowly	Slight	Severe: too clayey	Slight	Poor: hard to pack too clayey
Wilson-----	Severe: percs slowly	Slight	Severe: too clayey	Slight	Poor: hard to pack too clayey
BuA: Burleson-----	Severe: percs slowly	Slight	Severe: too clayey	Slight	Poor: hard to pack too clayey
CaA: Cadelake-----	Severe: wetness poor filter	Severe: seepage wetness	Severe: seepage too sandy wetness	Severe: seepage wetness	Poor: too sandy wetness too acid
ChC: Chazos-----	Severe: percs slowly	Severe: seepage	Moderate: too clayey	Slight	Poor: hard to pack
CoA: Coarsewood-----	Moderate: flooding	Severe: seepage	Severe: seepage	Severe: seepage	Good
CoB: Coarsewood-----	Moderate: flooding	Severe: seepage	Severe: seepage	Severe: seepage	Good

Soil Survey of Robertson County, Texas

Table 10.—Sanitary Facilities—Continued

Map symbol and soil name	Septic tank absorption fields	Sewage lagoon areas	Trench sanitary landfill	Area sanitary landfill	Daily cover for landfill
CrB: Crockett-----	Severe: percs slowly	Moderate: slope	Severe: too clayey	Slight	Poor: hard to pack too clayey
CrC2: Crockett-----	Severe: percs slowly	Moderate: slope	Severe: too clayey	Slight	Poor: hard to pack too clayey
DAM. Dam					
DfC: Desan-----	Severe: poor filter	Severe: seepage	Severe: too sandy	Severe: seepage	Poor: seepage too sandy
DmB: Dimebox-----	Severe: percs slowly	Moderate: slope	Severe: too clayey	Slight	Poor: hard to pack too clayey
DuB: Dutek-----	Severe: poor filter	Severe: seepage	Severe: seepage too sandy	Severe: seepage	Poor: seepage too sandy
DuD: Dutek-----	Severe: poor filter	Severe: seepage	Severe: seepage too sandy	Severe: seepage	Poor: seepage too sandy
EdC: Edge-----	Severe: percs slowly	Moderate: slope	Severe: too clayey	Slight	Poor: hard to pack too clayey
EdC2: Edge-----	Severe: percs slowly	Moderate: slope	Severe: too clayey	Slight	Poor: hard to pack too clayey
EdD2: Edge-----	Severe: percs slowly	Moderate: slope	Severe: too clayey	Slight	Poor: hard to pack too clayey
EgD: Edge-----	Severe: percs slowly	Moderate: slope	Severe: too clayey	Slight	Poor: hard to pack too clayey
Gullied land.					
EuC: Eufaula-----	Severe: poor filter	Severe: seepage	Severe: seepage too sandy	Severe: seepage	Poor: seepage too sandy

Soil Survey of Robertson County, Texas

Table 10.—Sanitary Facilities—Continued

Map symbol and soil name	Septic tank absorption fields	Sewage lagoon areas	Trench sanitary landfill	Area sanitary landfill	Daily cover for landfill
Ga: Gaddy-----	Severe: flooding poor filter	Severe: flooding seepage	Severe: flooding seepage too sandy	Severe: flooding seepage	Poor: seepage too sandy
GsB: Gasil-----	Moderate: percs slowly	Severe: seepage	Slight	Slight	Good
GsD: Gasil-----	Moderate: percs slowly	Severe: seepage	Slight	Slight	Good
HaB: Hammond-----	Severe: percs slowly	Moderate: slope	Moderate: too clayey	Slight	Fair: too clayey
HaE: Hammond-----	Severe: percs slowly	Severe: slope	Moderate: slope too clayey	Moderate: slope	Fair: slope too clayey
HeD: Hearne-----	Severe: percs slowly	Moderate: slope	Severe: too clayey too acid	Slight	Poor: hard to pack too clayey
HeE: Hearne-----	Severe: percs slowly	Severe: slope	Severe: too clayey too acid	Moderate: slope	Poor: hard to pack too clayey
HnD: Hearne-----	Severe: percs slowly	Moderate: slope	Severe: too clayey too acid	Slight	Poor: too clayey too acid
HnE: Hearne-----	Severe: percs slowly	Severe: slope	Severe: too clayey too acid	Moderate: slope	Poor: too clayey too acid
HrD: Hearne-----	Severe: percs slowly	Moderate: slope	Severe: too clayey too acid	Slight	Poor: hard to pack too clayey
HsA: Highbank-----	Severe: percs slowly	Moderate: seepage	Severe: too clayey	Moderate: flooding	Poor: hard to pack too clayey
LeC: Lexton-----	Severe: percs slowly	Moderate: slope	Severe: too clayey	Slight	Poor: hard to pack too clayey
LeE: Lexton-----	Severe: percs slowly	Severe: slope	Severe: too clayey	Moderate: slope	Poor: hard to pack too clayey

Soil Survey of Robertson County, Texas

Table 10.—Sanitary Facilities—Continued

Map symbol and soil name	Septic tank absorption fields	Sewage lagoon areas	Trench sanitary landfill	Area sanitary landfill	Daily cover for landfill
LfA: Lufkin-----	Severe: percs slowly	Slight	Severe: too clayey	Slight	Poor: hard to pack too clayey
LuB: Luling-----	Severe: percs slowly	Moderate: slope	Severe: too clayey	Slight	Poor: hard to pack too clayey
LuC: Luling-----	Severe: percs slowly	Moderate: slope	Severe: too clayey	Slight	Poor: hard to pack too clayey
MgB: Margie-----	Severe: percs slowly	Moderate: slope	Severe: too clayey	Slight	Poor: hard to pack too clayey
Na: Navasota-----	Severe: flooding percs slowly wetness	Severe: flooding	Severe: flooding too clayey wetness	Severe: flooding wetness	Poor: hard to pack too clayey wetness
Nd: Navasota-----	Severe: flooding percs slowly ponding	Severe: flooding ponding	Severe: flooding too clayey ponding	Severe: flooding ponding	Poor: hard to pack too clayey ponding
Ot: Oletha-----	Severe: flooding percs slowly wetness	Severe: flooding wetness	Severe: flooding wetness	Severe: flooding wetness	Fair: wetness
PaC: Padina-----	Severe: poor filter	Severe: seepage	Severe: too sandy	Severe: seepage	Poor: seepage too sandy
PaE: Padina-----	Severe: poor filter	Severe: seepage slope	Severe: too sandy	Severe: seepage	Poor: seepage too sandy
Pt. Pits and Dumps					
RaA: Rader-----	Severe: percs slowly wetness	Severe: seepage	Severe: too clayey	Severe: seepage	Poor: hard to pack too clayey
RoB: Robco-----	Severe: percs slowly wetness poor filter	Severe: seepage	Severe: wetness	Severe: seepage	Poor: thin layer

Soil Survey of Robertson County, Texas

Table 10.—Sanitary Facilities—Continued

Map symbol and soil name	Septic tank absorption fields	Sewage lagoon areas	Trench sanitary landfill	Area sanitary landfill	Daily cover for landfill
Rr: Roetex-----	Severe: flooding percs slowly ponding	Severe: flooding ponding	Severe: flooding too clayey ponding	Severe: flooding ponding	Poor: hard to pack too clayey ponding
RsC: Rosanky-----	Severe: percs slowly	Moderate: slope	Moderate: too clayey	Slight	Poor: thin layer
RsD: Rosanky-----	Severe: percs slowly	Moderate: slope	Moderate: too clayey	Slight	Poor: thin layer
RvC2: Rosanky-----	Severe: percs slowly	Moderate: slope	Moderate: too clayey	Slight	Poor: thin layer
Sa: Sandow-----	Severe: flooding percs slowly wetness	Severe: flooding	Severe: flooding	Severe: flooding	Fair: too clayey too sandy
ShA: Ships-----	Severe: percs slowly	Slight	Severe: too clayey	Moderate: flooding	Poor: hard to pack too clayey
ShB: Ships-----	Severe: percs slowly	Moderate: slope	Severe: too clayey	Moderate: flooding	Poor: hard to pack too clayey
Sk: Ships-----	Severe: flooding percs slowly	Severe: flooding	Severe: flooding too clayey	Severe: flooding	Poor: hard to pack too clayey
SmC: Silawa-----	Moderate: percs slowly	Severe: seepage	Severe: seepage	Severe: seepage	Fair: thin layer too clayey
SmD: Silawa-----	Moderate: percs slowly	Severe: seepage	Severe: seepage	Severe: seepage	Fair: thin layer too clayey
SnB: Silstid-----	Severe: poor filter	Severe: seepage	Moderate: too sandy	Severe: seepage	Poor: seepage
SnD: Silstid-----	Severe: poor filter	Severe: seepage	Moderate: too sandy	Severe: seepage	Poor: seepage
SpB: Spiller-----	Severe: percs slowly	Severe: seepage	Severe: too clayey	Slight	Poor: too clayey hard to pack

Soil Survey of Robertson County, Texas

Table 10.—Sanitary Facilities—Continued

Map symbol and soil name	Septic tank absorption fields	Sewage lagoon areas	Trench sanitary landfill	Area sanitary landfill	Daily cover for landfill
TaA: Tabor-----	Severe: percs slowly	Moderate: seepage	Severe: too clayey	Slight	Poor: hard to pack too clayey
Uh: Uhland-----	Severe: flooding percs slowly wetness	Severe: flooding wetness	Severe: flooding	Severe: flooding	Fair: wetness
W. Water					
WeA: Weswood-----	Moderate: flooding percs slowly	Moderate: seepage	Moderate: flooding too clayey	Moderate: flooding	Fair: too clayey
WwA: Weswood-----	Moderate: flooding percs slowly	Moderate: seepage	Moderate: flooding too clayey	Moderate: flooding	Fair: too clayey
WwB: Weswood-----	Moderate: flooding percs slowly	Moderate: seepage slope	Moderate: flooding too clayey	Moderate: flooding	Fair: too clayey
Wx: Weswood-----	Severe: flooding	Severe: flooding	Severe: flooding	Severe: flooding	Fair: too clayey
Yahola-----	Severe: flooding	Severe: flooding seepage	Severe: flooding seepage	Severe: flooding seepage	Good
Wy: Whitesboro-----	Severe: flooding	Severe: flooding	Severe: flooding	Severe: flooding	Fair: too clayey
WzA: Wilson-----	Severe: percs slowly	Slight	Severe: too clayey	Slight	Poor: hard to pack too clayey
YaA: Yahola-----	Moderate: flooding	Severe: seepage	Severe: seepage	Severe: seepage	Good
Zb: Zilaboy-----	Severe: flooding percs slowly wetness	Severe: flooding	Severe: flooding too clayey wetness	Severe: flooding wetness	Poor: hard to pack too clayey wetness

Soil Survey of Robertson County, Texas

Table 11.—Construction Materials

(The information in this table indicates the dominant soil condition but does not eliminate the need for onsite investigation. See text for definitions of terms used in this table. Absence of an entry indicates that no rating is applicable)

Map symbol and soil name	Roadfill	Sand	Gravel	Topsoil
AaD: Arenosa-----	Good	Probable	Improbable: too sandy	Poor: too sandy
BaB: Bastrop-----	Fair: low strength	Improbable: excess fines	Improbable: excess fines	Fair: too clayey
BeB: Benchley-----	Poor: low strength	Improbable: excess fines	Improbable: excess fines	Poor: too clayey
BeC: Benchley-----	Poor: low strength	Improbable: excess fines	Improbable: excess fines	Poor: too clayey
BrB: Bremond-----	Poor: low strength shrink-swell	Improbable: excess fines	Improbable: excess fines	Poor: too clayey
BsA: Bremond-----	Poor: low strength shrink-swell	Improbable: excess fines	Improbable: excess fines	Poor: too clayey
Wilson-----	Poor: low strength shrink-swell	Improbable: excess fines	Improbable: excess fines	Poor: too clayey
BuA: Burleson-----	Poor: low strength shrink-swell	Improbable: excess fines	Improbable: excess fines	Poor: too clayey
CaA: Cadelake-----	Poor: wetness	Improbable: excess fines	Improbable: excess fines	Poor: too sandy wetness too acid
ChC: Chazos-----	Poor: low strength	Improbable: excess fines	Improbable: excess fines	Poor: too clayey
CoA: Coarsewood-----	Good	Improbable: excess fines	Improbable: excess fines	Good
CoB: Coarsewood-----	Good	Improbable: excess fines	Improbable: excess fines	Good
CrB: Crockett-----	Poor: low strength shrink-swell	Improbable: excess fines	Improbable: excess fines	Poor: too clayey

Soil Survey of Robertson County, Texas

Table 11.—Construction Materials—Continued

Map symbol and soil name	Roadfill	Sand	Gravel	Topsoil
CrC2: Crockett-----	Poor: low strength shrink-swell	Improbable: excess fines	Improbable: excess fines	Poor: too clayey
DAM. Dam				
DfC: Desan-----	Good	Probable	Improbable: too sandy	Poor: too sandy
DmB: Dimebox-----	Poor: low strength shrink-swell	Improbable: excess fines	Improbable: excess fines	Poor: too clayey
DuB: Dutek-----	Good	Probable	Improbable: too sandy	Poor: too sandy
DuD: Dutek-----	Good	Probable	Improbable: too sandy	Poor: too sandy
EdC: Edge-----	Poor: low strength	Improbable: excess fines	Improbable: excess fines	Poor: too clayey
EdC2: Edge-----	Poor: low strength	Improbable: excess fines	Improbable: excess fines	Poor: too clayey
EdD2: Edge-----	Poor: low strength	Improbable: excess fines	Improbable: excess fines	Poor: too clayey
EgD: Edge-----	Poor: low strength	Improbable: excess fines	Improbable: excess fines	Poor: too clayey
Gullied land.				
EuC: Eufaula-----	Good	Probable	Improbable: too sandy	Poor: too sandy
Ga: Gaddy-----	Good	Probable	Improbable: too sandy	Poor: too sandy
GsB: Gasil-----	Good	Improbable: excess fines	Improbable: excess fines	Fair: too clayey
GsD: Gasil-----	Good	Improbable: excess fines	Improbable: excess fines	Fair: too clayey

Soil Survey of Robertson County, Texas

Table 11.—Construction Materials—Continued

Map symbol and soil name	Roadfill	Sand	Gravel	Topsoil
HaB: Hammond-----	Poor: low strength	Improbable: excess fines	Improbable: excess fines	Fair: small stones too clayey
HaE: Hammond-----	Poor: low strength	Improbable: excess fines	Improbable: excess fines	Fair: slope small stones too clayey
HeD: Hearne-----	Poor: low strength	Improbable: excess fines	Improbable: excess fines	Poor: too clayey too acid
HeE: Hearne-----	Poor: low strength	Improbable: excess fines	Improbable: excess fines	Poor: too clayey too acid
HnD: Hearne-----	Fair: low strength shrink-swell	Improbable: excess fines	Improbable: excess fines	Poor: too clayey too acid
HnE: Hearne-----	Fair: low strength shrink-swell	Improbable: excess fines	Improbable: excess fines	Poor: small stones too clayey too acid
HrD: Hearne-----	Poor: low strength	Improbable: excess fines	Improbable: excess fines	Poor: small stones too clayey too acid
HsA: Highbank-----	Poor: low strength shrink-swell	Improbable: excess fines	Improbable: excess fines	Poor: too clayey
LeC: Lexton-----	Poor: low strength	Improbable: excess fines	Improbable: excess fines	Poor: too clayey
LeE: Lexton-----	Poor: low strength	Improbable: excess fines	Improbable: excess fines	Poor: too clayey
LfA: Lufkin-----	Poor: low strength shrink-swell	Improbable: excess fines	Improbable: excess fines	Poor: too clayey
LuB: Luling-----	Poor: low strength shrink-swell	Improbable: excess fines	Improbable: excess fines	Poor: too clayey

Soil Survey of Robertson County, Texas

Table 11.—Construction Materials—Continued

Map symbol and soil name	Roadfill	Sand	Gravel	Topsoil
LuC: Luling-----	Poor: low strength shrink-swell	Improbable: excess fines	Improbable: excess fines	Poor: too clayey
MgB: Margie-----	Poor: low strength	Improbable: excess fines	Improbable: excess fines	Poor: small stones too clayey
Na: Navasota-----	Poor: low strength shrink-swell	Improbable: excess fines	Improbable: excess fines	Poor: too clayey
Nd: Navasota-----	Poor: low strength shrink-swell wetness	Improbable: excess fines	Improbable: excess fines	Poor: too clayey wetness
Ot: Oletha-----	Fair: low strength shrink-swell wetness	Improbable: excess fines	Improbable: excess fines	Fair: thin layer too clayey
PaC: Padina-----	Good	Probable	Improbable: too sandy	Poor: too sandy
PaE: Padina-----	Good	Probable	Improbable: too sandy	Poor: too sandy
Pt. Pits and Dumps				
RaA: Rader-----	Poor: low strength	Improbable: excess fines	Improbable: excess fines	Fair: thin layer
RoB: Robco-----	Poor: low strength	Improbable: excess fines	Improbable: excess fines	Fair: too sandy
Rr: Roetex-----	Poor: low strength shrink-swell wetness	Improbable: excess fines	Improbable: excess fines	Poor: too clayey wetness
RsC: Rosanky-----	Fair: thin layer	Improbable: excess fines	Improbable: excess fines	Poor: small stones too clayey
RsD: Rosanky-----	Fair: thin layer	Improbable: excess fines	Improbable: excess fines	Poor: small stones too clayey

Soil Survey of Robertson County, Texas

Table 11.—Construction Materials—Continued

Map symbol and soil name	Roadfill	Sand	Gravel	Topsoil
RvC2: Rosanky-----	Fair: thin layer	Improbable: excess fines	Improbable: excess fines	Poor: small stones too clayey
Sa: Sandow-----	Fair: low strength shrink-swell	Improbable: excess fines	Improbable: excess fines	Fair: too clayey too sandy
ShA: Ships-----	Poor: low strength shrink-swell	Improbable: excess fines	Improbable: excess fines	Poor: too clayey
ShB: Ships-----	Poor: low strength shrink-swell	Improbable: excess fines	Improbable: excess fines	Poor: too clayey
Sk: Ships-----	Poor: low strength shrink-swell	Improbable: excess fines	Improbable: excess fines	Poor: too clayey
SmC: Silawa-----	Good	Probable	Probable	Fair: area reclaim too clayey
SmD: Silawa-----	Good	Probable	Probable	Fair: area reclaim too clayey
SnB: Silstid-----	Good	Improbable: thin layer	Improbable: too sandy	Fair: too sandy
SnD: Silstid-----	Good	Improbable: thin layer	Improbable: too sandy	Fair: too sandy
SpB: Spiller-----	Good	Improbable: excess fines	Improbable: excess fines	Poor: too clayey
TaA: Tabor-----	Poor: low strength shrink-swell	Improbable: excess fines	Improbable: excess fines	Poor: too clayey
Uh: Uhland-----	Fair: thin layer wetness	Improbable: excess fines	Improbable: excess fines	Good
W. Water				

Soil Survey of Robertson County, Texas

Table 11.—Construction Materials—Continued

Map symbol and soil name	Roadfill	Sand	Gravel	Topsoil
WeA: Weswood-----	Poor: low strength	Improbable: excess fines	Improbable: excess fines	Fair: too clayey
WwA: Weswood-----	Poor: low strength	Improbable: excess fines	Improbable: excess fines	Fair: too clayey
WwB: Weswood-----	Poor: low strength	Improbable: excess fines	Improbable: excess fines	Fair: too clayey
Wx: Weswood-----	Poor: low strength	Improbable: excess fines	Improbable: excess fines	Fair: too clayey
Yahola-----	Good	Improbable: excess fines	Improbable: excess fines	Good
Wy: Whitesboro-----	Poor: low strength	Improbable: excess fines	Improbable: excess fines	Fair: too clayey
WzA: Wilson-----	Poor: low strength shrink-swell	Improbable: excess fines	Improbable: excess fines	Poor: too clayey
YaA: Yahola-----	Good	Improbable: excess fines	Improbable: excess fines	Good
Zb: Zilaboy-----	Fair: low strength shrink-swell wetness	Improbable: excess fines	Improbable: excess fines	Poor: too clayey

Table 12.--Water Management

(The information in this table indicates the dominant soil condition but does not eliminate the need for onsite investigation. See text for definitions of terms used in this table. Absence of an entry indicates that no rating is applicable)

Map symbol and soil name	Limitations for--			Features affecting--			
	Pond reservoir areas	Embankments, dikes, and levees	Aquifer-fed excavated ponds	Drainage	Irrigation	Terraces and diversions	Grassed waterways
AaD: Arenosa-----	Severe: seepage	Severe: seepage piping	Severe: no water	Limitation: deep to water	Limitation: fast intake slope droughty	Limitation: too sandy soil blowing	Limitation: droughty
BaB: Bastrop-----	Moderate: seepage	Moderate: piping	Severe: no water	Limitation: deep to water	Limitation: soil blowing	Limitation: erodes easily soil blowing	Limitation: erodes easily
BeB: Benchley-----	Slight	Severe: hard to pack	Severe: no water	Limitation: deep to water	Limitation: percs slowly	Limitation: percs slowly	Limitation: percs slowly
BeC: Benchley-----	Moderate: slope	Severe: hard to pack	Severe: no water	Limitation: deep to water	Limitation: percs slowly slope	Limitation: percs slowly	Limitation: percs slowly
BrB: Bremond-----	Slight	Moderate: hard to pack	Severe: no water	Limitation: deep to water	Limitation: erodes easily percs slowly	Limitation: erodes easily percs slowly	Limitation: erodes easily percs slowly
BsA: Bremond-----	Slight	Moderate: hard to pack	Severe: no water	Limitation: deep to water	Limitation: erodes easily percs slowly	Limitation: erodes easily percs slowly	Limitation: erodes easily percs slowly
Wilson-----	Slight	Severe: hard to pack	Severe: no water	Limitation: deep to water	Limitation: percs slowly	Limitation: erodes easily percs slowly	Limitation: erodes easily percs slowly
BuA: Burleson-----	Slight	Severe: hard to pack	Severe: no water	Limitation: deep to water	Limitation: percs slowly slow intake	Limitation: percs slowly	Limitation: percs slowly
CaA: Cadellake-----	Severe: seepage	Severe: seepage piping wetness	Severe: cutbanks cave	Limitation: too acid cutbanks cave	Limitation: wetness droughty	Limitation: too sandy wetness soil blowing	Limitation: wetness droughty

Table 12.--Water Management--Continued

Map symbol and soil name	Limitations for--			Features affecting--			
	Pond reservoir areas	Embankments, dikes, and levees	Aquifer-fed excavated ponds	Drainage	Irrigation	Terraces and diversions	Grassed waterways
ChC: Chazos-----	Slight	Moderate: hard to pack	Severe: no water	Limitation: deep to water	Limitation: fast intake slope droughty	Limitation: percs slowly soil blowing	Limitation: percs slowly droughty
CoA: Coarsewood-----	Severe: seepage	Severe: piping	Severe: no water	Limitation: deep to water	Limitation: erodes easily	Limitation: erodes easily	Limitation: erodes easily
CoB: Coarsewood-----	Severe: seepage	Severe: piping	Severe: no water	Limitation: deep to water	Limitation: erodes easily	Limitation: erodes easily	Limitation: erodes easily
CrB: Crockett-----	Slight	Severe: hard to pack	Severe: no water	Limitation: deep to water	Limitation: percs slowly droughty	Limitation: erodes easily percs slowly	Limitation: erodes easily droughty
CrC2: Crockett-----	Moderate: slope	Severe: hard to pack	Severe: no water	Limitation: deep to water	Limitation: percs slowly slope droughty	Limitation: erodes easily percs slowly	Limitation: erodes easily droughty
DAM. Dam							
DfC: Desan-----	Severe: seepage	Severe: seepage piping	Severe: no water	Limitation: deep to water	Limitation: fast intake slope droughty	Limitation: too sandy soil blowing	Limitation: droughty
DmB: Dimebox-----	Slight	Severe: hard to pack	Severe: no water	Limitation: deep to water	Limitation: percs slowly slow intake	Limitation: percs slowly	Limitation: percs slowly
DuB: Dutek-----	Severe: seepage	Severe: seepage piping	Severe: no water	Limitation: deep to water	Limitation: fast intake droughty	Limitation: too sandy soil blowing	Limitation: droughty
DuD: Dutek-----	Severe: seepage	Severe: seepage piping	Severe: no water	Limitation: deep to water	Limitation: fast intake slope droughty	Limitation: too sandy soil blowing	Limitation: droughty

Table 12.--Water Management--Continued

Map symbol and soil name	Limitations for--			Features affecting--			
	Pond reservoir areas	Embankments, dikes, and levees	Aquifer-fed excavated ponds	Drainage	Irrigation	Terraces and diversions	Grassed waterways
EdC: Edge-----	Moderate: slope	Severe: hard to pack	Severe: no water	Limitation: deep to water	Limitation: percs slowly slope soil blowing	Limitation: erodes easily soil blowing	Limitation: erodes easily percs slowly
EdC2: Edge-----	Moderate: slope	Severe: hard to pack	Severe: no water	Limitation: deep to water	Limitation: percs slowly slope soil blowing	Limitation: erodes easily soil blowing	Limitation: erodes easily percs slowly
EdD2: Edge-----	Moderate: slope	Severe: hard to pack	Severe: no water	Limitation: deep to water	Limitation: percs slowly slope soil blowing	Limitation: erodes easily soil blowing	Limitation: erodes easily percs slowly
EgD: Edge-----	Moderate: slope	Severe: hard to pack	Severe: no water	Limitation: deep to water	Limitation: percs slowly slope soil blowing	Limitation: erodes easily soil blowing	Limitation: erodes easily percs slowly
Gullied land.							
EuC: Eufaula-----	Severe: seepage	Severe: seepage piping	Severe: no water	Limitation: deep to water	Limitation: fast intake slope droughty	Limitation: too sandy soil blowing	Limitation: droughty
Ga: Gaddy-----	Severe: seepage	Severe: seepage piping	Severe: no water	Limitation: deep to water	Limitation: fast intake flooding droughty	Limitation: too sandy soil blowing	Limitation: droughty
GsB: Gasil-----	Moderate: seepage	Severe: piping	Severe: no water	Limitation: deep to water	Limitation: slope soil blowing droughty	Limitation: soil blowing	Limitation: droughty
GsD: Gasil-----	Moderate: seepage	Severe: piping	Severe: no water	Limitation: deep to water	Limitation: slope soil blowing droughty	Limitation: soil blowing	Limitation: droughty

Table 12.--Water Management--Continued

Map symbol and soil name	Limitations for--			Features affecting--			
	Pond reservoir areas	Embankments, dikes, and levees	Aquifer-fed excavated ponds	Drainage	Irrigation	Terraces and diversions	Grassed waterways
HaB: Hammond-----	Slight	Severe: piping	Severe: no water	Limitation: deep to water	Limitation: percs slowly soil blowing	Limitation: erodes easily soil blowing	Limitation: erodes easily percs slowly
HaE: Hammond-----	Severe: slope	Severe: piping	Severe: no water	Limitation: deep to water	Limitation: percs slowly slope soil blowing	Limitation: erodes easily slope soil blowing	Limitation: erodes easily percs slowly slope
HeD: Hearne-----	Moderate: slope	Moderate: hard to pack piping	Severe: no water	Limitation: deep to water	Limitation: slope droughty	Limitation: percs slowly soil blowing	Limitation: percs slowly droughty
HeE: Hearne-----	Severe: slope	Moderate: hard to pack piping	Severe: no water	Limitation: deep to water	Limitation: slope droughty	Limitation: percs slowly slope soil blowing	Limitation: percs slowly slope droughty
HnD: Hearne-----	Moderate: slope	Moderate: piping	Severe: no water	Limitation: deep to water	Limitation: slope droughty	Limitation: percs slowly	Limitation: percs slowly droughty
HnE: Hearne-----	Severe: slope	Moderate: piping	Severe: no water	Limitation: deep to water	Limitation: slope droughty	Limitation: percs slowly slope droughty	Limitation: percs slowly slope droughty
HrD: Hearne-----	Moderate: slope	Moderate: hard to pack piping	Severe: no water	Limitation: deep to water	Limitation: slope droughty	Limitation: percs slowly	Limitation: percs slowly droughty
HsA: Highbank-----	Slight	Severe: hard to pack	Severe: no water	Limitation: deep to water	Limitation: percs slowly	Limitation: percs slowly	Limitation: percs slowly
LeC: Lexton-----	Slight	Severe: hard to pack	Severe: no water	Limitation: deep to water	Limitation: slope	Favorable	Favorable

Table 12.—Water Management—Continued

Map symbol and soil name	Limitations for--			Features affecting--			
	Pond reservoir areas	Embankments, dikes, and levees	Aquifer-fed excavated ponds	Drainage	Irrigation	Terraces and diversions	Grassed waterways
LeE: Lexton-----	Slight	Severe: hard to pack	Severe: no water	Limitation: deep to water	Limitation: slope	Limitation: slope	Limitation: slope
LfA: Lufkin-----	Slight	Severe: hard to pack	Severe: no water	Limitation: deep to water	Limitation: percs slowly soil blowing droughty	Limitation: erodes easily percs slowly soil blowing	Limitation: erodes easily percs slowly droughty
LuB: Luling-----	Slight	Severe: hard to pack	Severe: no water	Limitation: deep to water	Limitation: percs slowly slow intake	Limitation: percs slowly	Limitation: percs slowly
LuC: Luling-----	Slight	Severe: hard to pack	Severe: no water	Limitation: deep to water	Limitation: percs slowly slope slow intake	Limitation: percs slowly	Limitation: percs slowly
MgB: Margie-----	Slight	Moderate: hard to pack thin layer	Severe: no water	Limitation: deep to water	Limitation: soil blowing droughty	Limitation: erodes easily soil blowing	Limitation: erodes easily droughty
Na: Navasota-----	Slight	Severe: hard to pack	Severe: no water	Limitation: flooding percs slowly	Limitation: percs slowly slow intake wetness	Limitation: percs slowly wetness	Limitation: percs slowly wetness
Nd: Navasota-----	Slight	Severe: hard to pack ponding	Severe: no water	Limitation: flooding percs slowly ponding	Limitation: percs slowly slow intake ponding	Limitation: percs slowly ponding	Limitation: percs slowly wetness
Ot: Oletha-----	Moderate: seepage	Moderate: excess salt piping wetness	Severe: slow refill	Limitation: excess salt flooding percs slowly	Limitation: percs slowly slow intake wetness	Limitation: wetness	Limitation: percs slowly
PaC: Padina-----	Severe: seepage	Severe: seepage piping	Severe: no water	Limitation: deep to water	Limitation: fast intake slope droughty	Limitation: too sandy soil blowing	Limitation: droughty

Table 12.--Water Management--Continued

Map symbol and soil name	Limitations for--			Features affecting--			
	Pond reservoir areas	Embankments, dikes, and levees	Aquifer-fed excavated ponds	Drainage	Irrigation	Terraces and diversions	Grassed waterways
PaE: Padina-----	Severe: seepage	Severe: seepage piping	Severe: no water	Limitation: deep to water	Limitation: fast intake slope droughty	Limitation: slope too sandy soil blowing	Limitation: slope droughty
Pt. Pits and Dumps							
RaA: Rader-----	Severe: seepage	Moderate: hard to pack wetness	Severe: no water	Limitation: percs slowly	Limitation: wetness	Limitation: erodes easily wetness soil blowing	Limitation: erodes easily percs slowly
RoB: Robco-----	Severe: seepage	Moderate: wetness	Severe: no water	Limitation: percs slowly	Limitation: wetness droughty	Limitation: erodes easily wetness soil blowing	Limitation: erodes easily percs slowly droughty
Rr: Roetex-----	Slight	Severe: hard to pack ponding	Severe: no water	Limitation: flooding percs slowly ponding	Limitation: percs slowly slow intake ponding	Limitation: percs slowly ponding	Limitation: percs slowly wetness
RSC: Rosanky-----	Slight	Severe: piping	Severe: no water	Limitation: deep to water	Limitation: slope	Limitation: erodes easily soil blowing	Limitation: erodes easily
RSD: Rosanky-----	Slight	Severe: piping	Severe: no water	Limitation: deep to water	Limitation: slope	Limitation: erodes easily soil blowing	Limitation: erodes easily
RvC2: Rosanky-----	Slight	Severe: piping	Severe: no water	Limitation: deep to water	Limitation: slope	Limitation: erodes easily soil blowing	Limitation: erodes easily
Sa: Sandow-----	Slight	Severe: piping	Severe: no water	Limitation: deep to water	Limitation: erodes easily flooding	Limitation: erodes easily too sandy	Limitation: erodes easily

Table 12.--Water Management--Continued

Map symbol and soil name	Limitations for--		Features affecting--			
	Pond reservoir areas	Embankments, dikes, and levees	Aquifer-fed excavated ponds	Drainage	Irrigation	Terraces and diversions
ShA: Ships-----	Slight	Severe: hard to pack	Severe: no water	Limitation: deep to water	Limitation: percs slowly slow intake	Limitation: percs slowly
ShB: Ships-----	Slight	Severe: hard to pack	Severe: no water	Limitation: deep to water	Limitation: percs slowly slow intake	Limitation: percs slowly
Sk: Ships-----	Slight	Severe: hard to pack	Severe: no water	Limitation: deep to water	Limitation: percs slowly slow intake	Limitation: percs slowly
SmC: Silava-----	Severe: seepage	Severe: thin layer	Severe: no water	Limitation: deep to water	Limitation: fast intake slope soil blowing	Favorable
SmD: Silava-----	Severe: seepage	Severe: thin layer	Severe: no water	Limitation: deep to water	Limitation: fast intake slope soil blowing	Favorable
SnB: Silstid-----	Moderate: seepage	Severe: seepage piping	Severe: no water	Limitation: deep to water	Limitation: fast intake droughty	Limitation: droughty
SND: Silstid-----	Moderate: seepage	Severe: seepage piping	Severe: no water	Limitation: deep to water	Limitation: fast intake slope droughty	Limitation: droughty
SpB: Spiller-----	Slight	Moderate: thin layer hard to pack	Severe: no water	Limitation: deep to water	Limitation: soil blowing percs slowly	Limitation: percs slowly
TaA: Tabor-----	Slight	Moderate: hard to pack	Severe: no water	Limitation: deep to water	Limitation: soil blowing droughty	Limitation: erodes easily percs slowly droughty

Table 12.--Water Management--Continued

Map symbol and soil name	Limitations for--			Features affecting--			
	Pond reservoir areas	Embankments, dikes, and levees	Aquifer-fed excavated ponds	Drainage	Irrigation	Terraces and diversions	Grassed waterways
Uh: Uhland-----	Moderate: seepage	Severe: piping	Severe: no water	Limitation: flooding	Limitation: erodes easily wetness soil blowing	Limitation: erodes easily wetness soil blowing	Limitation: erodes easily
W. Water							
WeA: Weswood-----	Moderate: seepage	Severe: piping	Severe: no water	Limitation: deep to water	Limitation: erodes easily	Limitation: erodes easily	Limitation: erodes easily
WwA: Weswood-----	Moderate: seepage	Severe: piping	Severe: no water	Limitation: deep to water	Limitation: erodes easily	Limitation: erodes easily	Limitation: erodes easily
WwB: Weswood-----	Moderate: seepage	Severe: piping	Severe: no water	Limitation: deep to water	Limitation: erodes easily	Limitation: erodes easily	Limitation: erodes easily
Wx: Weswood-----	Moderate: seepage	Severe: piping	Severe: no water	Limitation: deep to water	Limitation: erodes easily flooding	Limitation: erodes easily	Limitation: erodes easily
Yahola-----	Severe: seepage	Severe: piping	Severe: no water	Limitation: deep to water	Limitation: flooding	Favorable	Favorable
Wy: Whitesboro-----	Moderate: seepage	Moderate: piping	Severe: no water	Limitation: deep to water	Limitation: flooding	Favorable	Favorable
WzA: Wilson-----	Slight	Severe: hard to pack	Severe: no water	Limitation: deep to water	Limitation: percs slowly	Limitation: erodes easily percs slowly	Limitation: erodes easily percs slowly
Yaa: Yahola-----	Severe: seepage	Severe: piping	Severe: no water	Limitation: deep to water	Limitation: soil blowing	Limitation: soil blowing	Favorable
Zb: Zilaboy-----	Slight	Severe: wetness	Severe: slow refill	Limitation: flooding percs slowly	Limitation: percs slowly slow intake wetness	Limitation: percs slowly wetness	Limitation: percs slowly wetness

Table 13.--Engineering Index Properties

(Absence of an entry indicates that data were not estimated)

Map symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--				Liquid limit	Plas- ticity index
			Unified	AASHTO	>10 inches	3-10 inches	4	10	40	200		
	In				Pct	Pct					Pct	
AaD: Arenosa-----	0-8	Fine sand	SC-SM, SM, SP-SM	A-2-4, A-3	0	0	0	95-100	95-100	63-98	8-20	NP-4
	8-80	Sand, fine sand	SC-SM, SM, SP-SM	A-2-4, A-3	0	0	0	95-100	95-100	63-98	8-20	NP-6
BaB: Bastrop-----	0-13	Fine sandy loam	CL-ML, ML, SC-SM, SM	A-4	0	0	0	96-100	96-100	80-100	40-65	18-25
	13-70	Sandy clay loam, clay loam, loam	CL, SC	A-6	0	0	0	96-100	96-100	75-100	40-70	26-40
	70-80	Loam, sandy clay loam, clay loam	CL, SC	A-6	0	0	0	96-100	75-100	65-100	40-70	26-40
BeB: Benchley-----	0-13	Clay loam	CL	A-6, A-7	0	0	0	90-100	90-100	80-95	60-80	30-43
	13-20	Clay loam, clay	CH, CL	A-7	0	0	0	90-100	90-100	80-95	70-95	44-66
	20-64	Clay, clay loam	CH	A-7	0	0	0	95-100	90-100	90-100	75-95	56-75
	64-80	Stratified shale and sandstone	CH, CL	A-7	0	0	0	95-100	90-100	60-90	50-85	41-60
BeC: Benchley-----	0-10	Clay loam	CL	A-6, A-7	0	0	0	90-100	90-100	80-95	60-80	30-43
	10-18	Clay loam, clay	CH, CL	A-7	0	0	0	90-100	90-100	80-95	70-95	44-66
	18-62	Clay, clay loam	CH	A-7	0	0	0	95-100	90-100	90-100	75-95	56-75
	62-80	Stratified shale and sandstone	CH, CL	A-7	0	0	0	95-100	90-100	60-90	50-85	41-60
BrB: Bremond-----	0-7	Fine sandy loam	CL, CL-ML, SC, SM	A-4, A-6	0	0-2	0	98-100	95-100	89-100	40-95	16-35
	7-14	Clay	CH, CL	A-7	0	0-2	0	98-100	95-100	85-100	65-98	41-59
	14-65	Clay loam, clay	CH, CL	A-7	0	0-2	0	98-100	95-100	85-100	65-98	41-59
	65-80	Sandy clay loam, clay loam, clay	CH, CL	A-6, A-7	0	0-2	0	90-100	85-100	75-100	53-98	35-59

Table 13.--Engineering Index Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--				Liquid limit	Plas- ticity index
			Unified	AASHTO	>10 inches	3-10 inches	4	10	40	200		
	<u>In</u>				<u>Pct</u>	<u>Pct</u>					<u>Pct</u>	
BsA: Bremond-----	0-8	Fine sandy loam	CL, CL-ML, SC, SM	A-4, A-6	0	0-2	98-100	95-100	89-100	40-95	16-35	3-15
	8-15	Clay	CH, CL	A-7	0	0-2	98-100	95-100	85-100	65-98	41-59	23-40
	15-65	Clay loam, clay	CH, CL	A-7	0	0-2	98-100	95-100	85-100	65-98	41-59	23-40
	65-80	Sandy clay loam, clay loam, clay	CH, CL	A-6, A-7	0	0-2	90-100	85-100	75-100	53-98	35-59	20-40
Wilson-----	0-6	Clay loam	CL	A-6, A-7-6	0	0	95-100	85-100	80-100	60-96	38-49	20-30
	6-52	Silty clay, clay, clay loam	CH, CL	A-7-6	0	0	90-100	80-100	80-100	65-96	43-56	26-37
	52-80	Silty clay, clay, silty clay loam	CH, CL	A-6, A-7-6	0	0	95-100	90-100	85-100	70-96	38-65	24-48
BuA: Burleson-----	0-7	Clay	CH	A-7-6	0	0-2	90-100	90-100	90-99	67-97	56-75	33-49
	7-68	Clay, silty clay	CH	A-7-6	0	0-1	90-100	90-100	90-99	80-99	51-75	34-54
	68-80	Clay, silty clay, clay loam	CH	A-7-6	0	0-2	90-100	80-100	75-99	67-98	51-75	34-54
CaA: Cadelake-----	0-8	Fine sandy loam	SC-SM, SM	A-2-4	0	0	100	100	80-95	20-35	15-25	NP-7
	8-18	Loamy fine sand	SC-SM, SM	A-2-4	0	0	100	100	80-95	15-30	15-25	NP-7
	18-80	Loamy fine sand, fine sand	SC-SM, SM	A-2-4	0	0	100	98-100	80-95	15-30	15-25	NP-7
ChC: Chazos-----	0-14	Loamy fine sand	SC-SM, SM	A-2-4, A-4	0	0	80-100	75-100	60-98	20-50	0-25	NP-4
	14-22	Sandy clay, clay, clay loam	CH, CL	A-7-6	0	0	90-100	75-100	70-100	55-85	43-58	21-35
	22-35	Clay loam, sandy clay loam, sandy clay	CH, CL, SC	A-7-6	0	0	90-100	75-100	65-95	35-75	43-58	21-35
	35-80	Clay loam, sandy clay loam, clay	CH, CL	A-6, A-7-6	0	0	90-100	75-100	70-95	50-85	35-55	15-35

Table 13.--Engineering Index Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--				Liquid limit	Plas- ticity index
			Unified	AASHTO	>10 inches	3-10 inches	4	10	40	200		
	<u>In</u>				<u>Pct</u>	<u>Pct</u>					<u>Pct</u>	
CoA: Coarsewood-----	0-5	Silt loam	CL, CL-ML, ML A-4		0	0	100	96-100	95-100	64-95	16-28	NP-10
	5-44	Very fine sandy loam, loam, silt loam	CL, CL-ML, ML A-4		0	0	100	96-100	95-100	64-95	16-28	NP-10
	44-80	Stratified very fine sandy loam to silt loam	CL, CL-ML, ML A-4		0	0	100	96-100	90-100	64-95	16-28	NP-10
CoB: Coarsewood-----	0-7	Silt loam	CL, CL-ML, ML A-4		0	0	100	96-100	95-100	64-95	16-28	NP-10
	7-46	Very fine sandy loam, loam, silt loam	CL, CL-ML, ML A-4		0	0	100	96-100	95-100	64-95	16-28	NP-10
	46-80	Stratified very fine sandy loam to silt loam	CL, CL-ML, ML A-4		0	0	100	96-100	90-100	64-95	16-28	NP-10
CrB: Crockett-----	0-7	Loam	CL, ML, SC, SM	A-4, A-6	0	0-2	98-100	94-100	89-100	40-96	15-35	3-15
	7-26	Clay, clay loam, sandy clay	CH, CL	A-6, A-7	0	0	89-100	75-100	75-100	60-98	35-59	23-42
	26-48	Clay, clay loam, sandy clay	CH, CL	A-6, A-7	0	0	89-100	75-100	75-100	65-98	35-59	23-42
	48-55	Clay loam, sandy clay loam, clay	CH, CL	A-6, A-7	0	0-5	90-100	85-100	75-100	50-90	30-60	15-40
	55-80	Stratified loam to clay	CH, CL	A-7	0	0-5	90-100	90-100	90-100	70-99	45-71	27-52

Table 13.--Engineering Index Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--				Liquid limit	Plas- ticity index
			Unified	AASHTO	>10 inches	3-10 inches	4	10	40	200		
CrC2: Crockett-----	<u>In</u>				<u>Pct</u>	<u>Pct</u>					<u>Pct</u>	
	0-3	Loam	CL, ML, SC, SM	A-4, A-6	0	0-2	98-100	94-100	89-100	40-96	15-35	3-15
	3-12	Clay, clay loam, sandy clay	CH, CL	A-6, A-7	0	0	89-100	75-100	75-100	60-98	35-59	23-42
	12-43	Clay, clay loam, sandy clay	CH, CL	A-6, A-7	0	0	89-100	75-100	75-100	65-98	35-59	23-42
	43-52	Clay loam, sandy clay loam, clay	CH, CL	A-6, A-7	0	0-5	90-100	85-100	75-100	50-90	30-60	15-40
DfC: Desan-----	52-80	Stratified loam to clay	CH, CL	A-7	0	0-5	90-100	90-100	90-100	70-99	45-71	27-52
	0-10	Loamy fine sand	SC-SM, SM, SP-SM	A-2-4, A-3	0	0	98-100	95-100	85-100	8-28	16-25	NP-5
	10-62	Loamy fine sand, fine sand	SC-SM, SM, SP-SM	A-2-4, A-3	0	0	98-100	95-100	85-100	8-28	16-25	NP-5
DmB: Dinebox-----	62-80	Sandy clay loam, fine sandy loam	SC	A-2, A-4, A-6	0	0	98-100	95-100	90-100	25-50	20-36	8-20
	0-7	Clay	CH	A-7-5, A-7-6	0	0	90-100	90-100	90-100	85-96	51-90	27-55
	7-63	Clay, silty clay	CH	A-7-5, A-7-6	0	0	90-100	90-100	90-100	85-96	51-90	27-55
	63-80	Clay	CH	A-7-5, A-7-6	0	0	90-100	90-100	85-100	75-96	51-90	30-57

Table 13.--Engineering Index Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification		Fragments			Percentage passing sieve number--				Liquid limit	Plas- ticity index
			Unified	AASHTO	>10 inches	3-10 inches	4	10	40	200			
DuB: Dutek-----	<u>In</u>				<u>Pct</u>	<u>Pct</u>					<u>Pct</u>		
	0-17	Loamy fine sand	SM, SP-SM	A-2, A-3	0	0	0	95-100	95-100	85-100	9-25	15-25	NP-3
	17-27	Fine sand, loamy fine sand, loamy sand	SM, SP-SM	A-2, A-3	0	0	0	95-100	95-100	85-100	9-25	15-25	NP-3
	27-51	Sandy clay loam, clay loam, sandy clay	CL, CL-ML, SC, SC-SM	A-2, A-4, A-6	0	0	0	98-100	95-100	90-100	30-55	24-40	6-20
	51-58	Fine sandy loam, sandy clay loam, loam	CL, CL-ML, SC, SC-SM	A-2, A-4, A-6	0	0	0	95-100	95-100	90-100	22-55	20-40	4-20
DuD: Dutek-----	58-80	Loamy fine sand, fine sandy loam	SC-SM, SM, SP-SM	A-2	0	0	0	95-100	95-100	85-100	10-35	15-22	NP-7
	0-6	Loamy fine sand	SM, SP-SM	A-2, A-3	0	0	0	95-100	95-100	85-100	9-25	15-25	NP-3
	6-22	Fine sand, loamy fine sand, loamy sand	SM, SP-SM	A-2, A-3	0	0	0	95-100	95-100	85-100	9-25	15-25	NP-3
	22-58	Sandy clay loam, clay loam, sandy clay	CL, CL-ML, SC, SC-SM	A-2, A-4, A-6	0	0	0	98-100	95-100	90-100	30-55	24-40	6-20
	58-68	Fine sandy loam, sandy clay loam, loam	CL, CL-ML, SC, SC-SM	A-4, A-6, A-2	0	0	0	95-100	95-100	90-100	22-55	20-40	4-20
68-80	Loamy fine sand, fine sandy loam	SC-SM, SM, SP-SM	A-2	0	0	0	95-100	95-100	85-100	10-35	15-22	NP-7	

Table 13.--Engineering Index Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification		Fragments			Percentage passing sieve number--				Liquid limit	Plas- ticity index
			Unified	AASHTO	>10 inches	3-10 inches		4	10	40	200		
						Pct	Pct					Pct	
EdC: Edge-----	In											Pct	
	0-12	Fine sandy loam	CL-ML, ML, SC-SM, SM	A-4	0	0	0	98-100	96-100	80-100	45-75	15-30	NP-7
	12-34	Sandy clay, clay	CH, CL	A-7-6	0	0	0	98-100	97-100	90-100	70-98	48-65	29-42
	34-50	Clay loam, sandy clay	CL	A-6, A-7-6	0-5	0	0	98-100	96-100	90-100	65-96	30-49	14-30
	50-74	Fine sandy loam, sandy clay loam,	CL, CL-ML, SC, SC-SM	A-4, A-6, A-7-6	0-10	0	0	95-100	90-100	72-100	48-78	18-45	4-25
EdC2: Edge-----	74-80	Stratified siltstone and sandstone	CH, CL, SC	A-2-6, A-2-7, A-6	0	0	0	95-100	90-100	72-100	29-80	25-51	11-34
	0-4	Fine sandy loam	CL-ML, ML, SC-SM, SM	A-4	0	0	0	98-100	96-100	80-100	45-75	15-30	NP-7
	4-41	Sandy clay, clay	CH, CL	A-7-6	0	0	0	98-100	97-100	90-100	70-98	48-65	29-42
	41-47	Clay loam, sandy clay	CL	A-6, A-7-6	0-5	0	0	98-100	96-100	90-100	65-96	30-49	14-30
	47-80	Stratified siltstone and sandstone	CH, CL, SC	A-2-6, A-2-7, A-6	0	0	0	95-100	90-100	72-100	29-80	25-51	11-34
EdD2: Edge-----	0-4	Fine sandy loam	CL-ML, ML, SC-SM, SM	A-4	0	0	0	98-100	96-100	80-100	45-75	15-30	NP-7
	4-24	Sandy clay, clay	CH, CL	A-7-6	0	0	0	98-100	97-100	90-100	70-98	48-65	29-42
	24-43	Clay loam, sandy clay	CL	A-6, A-7-6	0-5	0	0	98-100	96-100	90-100	65-96	30-49	14-30
	43-64	Fine sandy loam, sandy clay loam,	CL, CL-ML, SC, SC-SM	A-4, A-6, A-7-6	0-10	0	0	95-100	90-100	72-100	48-78	18-45	4-25
	64-80	clay loam, Stratified siltstone and sandstone	CH, CL, SC	A-2-6, A-2-7, A-6	0	0	0	95-100	90-100	72-100	29-80	25-51	11-34

Table 13.--Engineering Index Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--				Liquid limit	Plas- ticity index
			Unified	AASHTO	>10 inches	3-10 inches	4	10	40	200	Pct	
	<u>In</u>				<u>Pct</u>	<u>Pct</u>					<u>Pct</u>	
EgD: Edge-----	0-5	Fine sandy loam	CL-ML, ML, SC-SM, SM	A-4	0	0	0	98-100	96-100	80-100	45-75	15-30 NP-7
	5-45	Sandy clay, clay	CH, CL	A-7-6	0	0	0	98-100	97-100	90-100	70-98	48-65 29-42
	45-54	Clay loam, sandy clay	CL	A-6, A-7-6	0-5	0	0	98-100	96-100	90-100	65-96	30-49 14-30
	54-80	Stratified siltstone and sandstone	CH, CL, SC	A-2-6, A-2-7, A-6	0	0	0	95-100	90-100	72-100	29-80	25-51 11-34
Gullied land.												
EuC: Eufaula-----	0-31	Loamy fine sand	SM	A-2	0	0	0	100	100	90-100	15-35	0-14 NP
	31-80	Loamy fine sand, fine sand	SM, SP-SM	A-2, A-3	0	0	0	100	100	82-100	5-35	0-14 NP-4
Ga: Gaddy-----	0-9	Loamy fine sand	SM, SP-SM	A-2, A-3	0	0	0	100	98-100	80-100	5-35	0-14 NP
	9-80	Stratified fine sand to silt loam	SM, SP-SM	A-2, A-3	0	0	0	100	98-100	80-100	5-35	0-37 NP
GsB: Gasil-----	0-15	Loamy fine sand	SC-SM, SM	A-2-4, A-4	0	0	0	95-100	95-100	65-100	15-40	16-20 NP-4
	15-80	Sandy clay loam, loam, fine sandy loam	CL, CL-ML, SC, SC-SM	A-4, A-6	0	0	0	95-100	95-100	85-100	36-71	22-40 7-20
GsD: Gasil-----	0-11	Loamy fine sand	SC-SM, SM	A-2-4, A-4	0	0	0	95-100	95-100	65-100	15-40	16-20 NP-4
	11-80	Sandy clay loam, loam, fine sandy loam	CL, CL-ML, SC, SC-SM	A-4, A-6	0	0	0	95-100	95-100	85-100	36-71	22-40 7-20
HaB: Hammond-----	0-8	Fine sandy loam	CL-ML, ML, SM	A-6, A-7-6	0	0-2	100	100	90-100	65-80	40-50	25-32 8-14
	8-80	Loam, clay loam	CL, CL-ML	A-4, A-6	0	0-2	100	100	90-100	80-95	60-75	30-48 10-25
HaE: Hammond-----	0-6	Fine sandy loam	CL-ML, ML, SM	A-6, A-7-6	0	0-2	100	100	90-100	65-80	40-50	25-32 8-14
	6-80	Loam, clay loam	CL, CL-ML	A-4, A-6	0	0-2	100	100	90-100	80-95	60-75	30-48 10-25

Table 13.--Engineering Index Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--				Liquid limit	Plas- ticity index
			Unified	AASHTO	>10 inches	3-10 inches	4	10	40	200		
HeD: Hearne-----	<u>In</u>				<u>Pct</u>	<u>Pct</u>					<u>Pct</u>	
	0-10	Fine sandy loam	CL-ML, ML, SC-SM, SM	A-4	0	0-2	75-100	75-100	65-100	36-55	16-25	NP-7
	10-25	Clay, sandy clay	CH, CL	A-7	0	0-1	90-100	85-100	85-100	51-95	40-65	20-40
	25-80	Stratified shale and sandstone	CL, SC	A-2, A-6, A-7	0	0-3	85-100	85-100	80-100	28-85	29-45	11-26
HeE: Hearne-----	0-5	Fine sandy loam	CL-ML, ML, SC-SM, SM	A-4	0	0-2	75-100	75-100	65-100	36-55	16-25	NP-7
	5-29	Clay, sandy clay	CH, CL	A-7	0	0-1	90-100	85-100	85-100	51-95	40-65	20-40
	29-80	Stratified shale and sandstone	CL, SC	A-2, A-6, A-7	0	0-3	85-100	85-100	80-100	28-85	29-45	11-26
HnD: Hearne-----	0-1	Fine sandy loam	CL-ML, ML, SC-SM, SM	A-4	0	0-2	75-100	75-100	65-85	36-55	16-30	NP-7
	1-24	Clay, sandy clay	CH, CL	A-7	0	0-1	90-100	85-100	85-100	51-95	40-65	20-40
	24-80	Stratified fine sandy loam to clay	CL, SC	A-2, A-6, A-7	0	0-3	85-100	85-100	80-100	28-85	29-45	11-26
HnE: Hearne-----	0-13	Fine sandy loam	CL-ML, ML, SC-SM, SM	A-4	0	0-2	75-100	75-100	65-85	36-55	16-30	NP-7
	13-36	Clay, sandy clay	CH, CL	A-7	0-1	0-5	80-100	80-100	65-95	51-85	40-65	20-40
	36-80	Stratified shale and sandstone	CL, SC	A-2, A-6, A-7	0	0-3	85-100	85-100	80-100	28-85	29-45	11-26
HrD: Hearne-----	0-9	Gravelly fine sandy loam	GC-GM, GM, SC-SM, SM	A-1, A-2	0-1	0-5	55-75	40-75	40-65	20-35	16-25	NP-7
	9-28	Clay, sandy clay	CH, CL	A-7	0	0-1	90-100	85-100	85-100	51-95	40-65	20-40
	28-80	Stratified shale and sandstone	CL, SC	A-2, A-6, A-7	0	0-3	85-100	85-100	80-100	28-85	29-45	11-26

Table 13.--Engineering Index Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification		Fragments			Percentage passing sieve number--				Liquid limit	Plas- ticity index
			Unified	AASHTO	>10 inches	3-10 inches	4	10	40	200			
In					Pct	Pct					Pct		
HsA: Highbank-----	0-17	Silty clay loam	CL	A-6, A-7	0	0	0	100	95-100	75-98	30-50	15-30	
	17-44	Clay	CH	A-7-6	0	0	0	99-100	99-100	95-100	55-75	35-50	
	44-80	Clay, silty clay, silty clay loam	CH	A-7-6	0	0	0	98-100	98-100	95-100	85-100	51-70	
LeC: Lexton-----	0-6	Clay loam	CL, CL-ML, SC, SC-SM	A-4, A-6	0	0	0	90-100	85-100	65-95	36-65	25-35	
	6-55	Clay, clay loam	CH, CL, MH, ML	A-7	0	0	0	90-100	75-98	70-95	51-70	41-60	
	55-80	Variable			---	---	---	---	---	---	---	---	
LeE: Lexton-----	0-5	Clay loam	CL, CL-ML, SC, SC-SM	A-4, A-6	0	0	0	90-100	85-100	65-95	36-65	25-35	
	5-52	Clay, clay loam	CH, CL, MH, ML	A-7	0	0	0	90-100	75-98	70-95	51-70	41-60	
	52-80	Variable			---	---	---	---	---	---	---	---	
LfA: Lufkin-----	0-9	Loam	CL, ML, SC, SM	A-4	0	0-5	0	90-100	80-100	40-85	15-30	NP-10	
	9-80	Clay, clay loam, silty clay loam	CH, CL	A-7-6	0	0	0	90-100	90-100	65-95	45-67	30-45	
LuB: Luling-----	0-13	Clay	CH	A-7-6	0	0-2	0	95-100	90-100	80-100	65-98	51-70	
	13-52	Clay, silty clay	CH	A-7-6	0	0-2	0	95-100	90-100	80-100	65-98	51-70	
	52-64	Clay, silty clay	CH	A-7-6	0	0-2	0	95-100	90-100	80-100	65-98	51-70	
	64-80	Shale	CH	A-7-6	0	0-2	0	95-100	90-100	80-100	65-98	51-70	
LuC: Luling-----	0-8	Clay	CH	A-7-6	0	0-2	0	95-100	90-100	80-100	65-98	51-70	
	8-40	Clay, silty clay	CH	A-7-6	0	0-2	0	95-100	90-100	80-100	65-98	51-70	
	40-62	Clay, silty clay	CH	A-7-6	0	0-2	0	95-100	90-100	80-100	65-98	51-70	
	62-80	Shale	CH	A-7-6	0	0-2	0	95-100	90-100	80-100	65-98	51-70	

Table 13.--Engineering Index Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--				Liquid limit	Plas- ticity index
			Unified	AASHTO	>10 inches	3-10 inches	4	10	40	200		
	<u>In</u>				<u>Pct</u>	<u>Pct</u>					<u>Pct</u>	
MgB: Margie-----	0-6	Fine sandy loam	ML, SM	A-2-4, A-4	0	0-2	80-100	80-100	70-95	30-65	0-30	NP-7
	6-28	Sandy clay loam, clay loam, clay	CH, CL	A-6, A-7-6	0	0-2	95-100	75-100	75-95	51-90	37-56	19-34
	28-66	Gravelly clay, very gravelly clay, clay	GC, SC, CH, CL	A-7	0	0-2	60-90	55-85	50-80	36-65	41-60	18-35
	66-72	Sandy clay loam, clay loam, sandy clay	CH, CL	A-6, A-7-6	0	0-2	95-100	65-95	65-95	51-90	32-56	16-30
	72-80	Variable			---	---	---	---	---	---	---	---
Na: Navasota-----	0-7	Clay	CH, CL	A-7	0	0	100	100	95-100	85-95	48-75	25-50
	7-69	Clay, silty clay	CH	A-7	0	0	100	100	95-100	85-95	51-75	30-50
	69-80	Sandy clay, clay, silty clay	CH, CL	A-7	0	0	100	100	90-100	50-85	48-75	25-50
Nd: Navasota-----	0-11	Clay	CH, CL	A-7	0	0	100	100	95-100	85-95	48-75	25-50
	11-61	Clay, silty clay	CH	A-7	0	0	100	100	95-100	85-95	51-75	30-50
	61-80	Clay, silty clay	CH, CL	A-7	0	0	100	100	95-100	95	51-75	30-50
Ot: Oletha-----	0-6	Clay	CH	A-7-5, A-7-6	0	0	100	100	90-100	80-90	52-80	30-46
	6-39	Sandy clay loam, clay loam	CL	A-6, A-7-6	0	0	100	96-100	85-100	60-85	34-43	14-21
	39-50	Loam, sandy clay loam, clay loam	CL	A-6, A-7-6	0	0	100	96-100	80-100	55-85	34-43	14-21
	50-72	Loam, sandy clay loam, clay loam	CL	A-6, A-7-6	0	0	100	96-100	85-100	55-75	34-43	14-21
	72-80	Fine sandy loam, sandy clay loam	CL, SC	A-6	0	0	100	96-100	85-100	45-70	25-35	14-23

Table 13.--Engineering Index Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification		Fragments			Percentage passing sieve number--				Liquid limit	Plas- ticity index
			Unified	AASHTO	>10 inches	3-10 inches	4	10	40	200	Pct		
	<u>In</u>				<u>Pct</u>	<u>Pct</u>							
PaC: Padina-----	0-5	Loamy fine sand	SC-SM, SM	A-2-4	0	0	100	95-100	85-100	15-35		NP-5	
	5-56	Fine sand, loamy fine sand	SC-SM, SM, SP-SM	A-2-4, A-3	0	0	100	95-100	85-100	8-28		NP-5	
	56-80	Sandy clay loam, fine sandy loam	CL, SC	A-2, A-4, A-6, A-7	0	0	90-100	90-100	90-100	25-65		22-42	8-22
PaE: Padina-----	0-5	Loamy fine sand	SC-SM, SM	A-2-4	0	0	100	95-100	85-100	15-35		NP-5	
	5-53	Fine sand, loamy fine sand	SC-SM, SM, SP-SM	A-2-4, A-3	0	0	100	95-100	85-100	8-28		NP-5	
	53-80	Sandy clay loam, fine sandy loam	CL, SC	A-2, A-4, A-6, A-7	0	0	90-100	90-100	90-100	25-65		22-42	8-22
Pt. Pits and Dumps													
RaA: Rader-----	0-14	Fine sandy loam	CL-ML, ML, SC, SM	A-2, A-4	0	0	98-100	98-100	90-100	34-75		18-28	3-10
	14-21	Fine sandy loam, very fine sandy loam, loam	CL-ML, ML, SC, SM	A-2, A-4	0	0	98-100	95-100	90-100	34-75		18-28	3-10
	21-24	Loam, sandy clay loam, clay loam	CL, SC	A-6	0	0	95-100	95-100	90-100	36-75		26-40	11-22
	24-49	Clay loam, sandy clay, clay	CH, CL	A-6, A-7	0	0	95-100	95-100	90-100	51-90		36-60	18-38
	49-80	Sandy clay loam, sandy clay, clay	CH, CL, SC	A-6, A-7	0	0	95-100	95-100	90-100	36-75		25-52	11-36

Soil Survey of Robertson County, Texas

Table 13.--Engineering Index Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--					Liquid limit	Plas- ticity index
			Unified	AASHTO	>10 inches	3-10 inches	4	10	40	200			
											Pct		
RoB: Robco-----	In										Pct		
	0-16	Loamy fine sand	SM, SP-SM	A-2-4, A-3	0	0	80-100	80-100	65-95	8-35	0-25	NP-3	
	16-29	Loamy fine sand, fine sand	SM, SP-SM	A-2-4, A-3	0	0	80-100	80-100	65-95	8-35	0-25	NP-3	
	29-34	Sandy clay loam, loam, clay loam	CL, SC	A-4, A-6	0	0	98-100	98-100	80-100	36-75	26-40	8-22	
	34-40	Clay loam, sandy clay loam	CL	A-6, A-7	0	0	98-100	98-100	80-100	50-80	36-50	16-28	
Rr: Roetex-----	40-80	Sandy clay loam, clay loam, clay	CL, SC	A-6, A-7	0	0	98-100	98-100	80-100	40-95	32-50	13-28	
	0-17	Clay	CH, CL	A-7	0	0	100	100	95-100	90-100	48-70	35-50	
	17-55	Clay	CH, CL	A-7	0	0	100	98-100	95-100	90-100	48-66	35-50	
	55-80	Clay, silty clay, clay loam	CH, CL	A-6, A-7	0	0	100	98-100	95-100	75-100	38-66	25-50	
RsC: Rosanky-----	0-7	Fine sandy loam	SC-SM, SM	A-2-4, A-4	0	0-2	80-100	75-100	75-100	30-50	15-25	NP-7	
	7-39	Sandy clay, clay	CH, CL, SC	A-6, A-7-6	0	0-2	85-100	75-100	75-100	49-90	37-56	19-34	
	39-80	Sandy clay loam, clay loam, fine sandy loam	CL, CL-ML, SC, SC-SM	A-4, A-6	0	0-5	80-100	75-100	75-100	45-70	23-40	5-19	
RsD: Rosanky-----	0-6	Fine sandy loam	SC-SM, SM	A-2-4, A-4	0	0-2	80-100	75-100	75-100	30-50	15-25	NP-7	
	6-36	Sandy clay, clay	CH, CL, SC	A-6, A-7-6	0	0-2	85-100	75-100	75-100	49-90	37-56	19-34	
	36-80	Sandy clay loam, clay loam, fine sandy loam	CL, CL-ML, SC, SC-SM	A-4, A-6	0	0-5	80-100	75-100	75-100	45-70	23-40	5-19	
RvC2: Rosanky-----	0-4	Fine sandy loam	SC-SM, SM	A-2-4, A-4	0	0-2	80-100	75-100	75-100	30-50	15-25	NP-7	
	4-35	Sandy clay, clay	CH, CL, SC	A-7-6, A-6	0	0-2	85-100	75-100	75-100	49-90	37-56	19-34	
	35-80	Sandy clay loam, clay loam, fine sandy loam	CL, CL-ML, SC, SC-SM	A-4, A-6	0	0-5	80-100	75-100	75-100	45-70	23-40	5-19	

Table 13.--Engineering Index Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification		Fragments			Percentage passing sieve number--				Liquid limit	Plas- ticity index
			Unified	AASHTO	>10 inches	3-10 inches	4	10	40	200			
Sa: Sandow-----	<u>In</u>				<u>Pct</u>	<u>Pct</u>					<u>Pct</u>		
	0-9	Loam	CL, CL-ML, SC, SC-SM	A-4, A-6	0	0	100	100	80-95	45-80	25-40	6-20	
	9-80	Stratified loamy sand to clay loam	CL, CL-ML, SC	A-4, A-6, A-7-6	0	0	100	100	65-100	30-75	25-47	7-28	
ShA: Ships-----	0-6	Clay	CH	A-7-6	0	0	100	100	95-100	95-100	55-75	35-50	
	6-70	Clay	CH	A-7-6	0	0	100	100	95-100	95-100	55-75	35-50	
	70-80	Clay, silty clay, silty clay loam	CH	A-7-6	0	0	100	100	95-100	85-100	51-70	32-50	
ShB: Ships-----	0-15	Clay	CH	A-7-6	0	0	100	100	95-100	95-100	55-75	35-50	
	15-65	Clay	CH	A-7-6	0	0	100	100	95-100	95-100	55-75	35-50	
	65-80	Clay, silty clay, silty clay loam	CH	A-7-6	0	0	100	100	95-100	85-100	51-70	32-50	
Sk: Ships-----	0-10	Clay	CH	A-7-6	0	0	100	100	95-100	95-100	55-75	35-50	
	10-65	Clay	CH	A-7-6	0	0	100	100	95-100	95-100	55-75	35-50	
	65-80	Clay, silty clay, silty clay loam	CH	A-7-6	0	0	100	100	95-100	85-100	51-70	32-50	
SmC: Silawa-----	0-15	Loamy fine sand	SC-SM, SM	A-2-4	0	0	95-100	95-100	70-100	15-35	16-22	NP-4	
	15-41	Sandy clay loam, fine sandy loam, clay loam	CL, SC	A-4, A-6	0	0	85-100	85-100	80-100	35-65	25-40	8-18	
	41-57	Fine sandy loam, gravelly fine sandy loam, sandy clay loam	CL, CL-ML, SC, SC-SM	A-2-4, A-4, A-6	0	0-2	70-100	70-100	38-100	18-60	21-34	4-14	
	57-80	Loamy fine sand, gravelly loamy fine sandy loam	GM, SC-SM, SM, SP-SM	A-1-b, A-2-4, A-4	0	0-2	51-100	51-100	38-100	12-40	16-26	NP-7	

Table 13.--Engineering Index Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--					Liquid limit	Plas- ticity index
			Unified	AASHTO	>10 inches	3-10 inches	4	10	40	200			
	<u>In</u>				<u>Pct</u>	<u>Pct</u>						<u>Pct</u>	
SmD: Silawa-----	0-14	Loamy fine sand	SC-SM, SM	A-2-4	0	0	95-100	95-100	70-100	15-35	16-22	NP-4	
	14-43	Sandy clay loam, fine sandy loam, clay loam	CL, SC	A-4, A-6	0	0	85-100	85-100	80-100	35-65	25-40	8-18	
	43-48	Fine sandy loam, gravelly fine sandy loam, sandy clay loam	CL, CL-ML, SC, SC-SM	A-2-4, A-4, A-6	0	0-2	70-100	70-100	38-100	18-60	21-34	4-14	
	48-80	Loamy fine sand, gravelly loamy fine sand, fine sandy loam	GM, SC-SM, SM, SP-SM	A-1-b, A-2-4, A-4	0	0-2	51-100	51-100	38-100	12-40	16-26	NP-7	
SnB: Silstid-----	0-6	Loamy fine sand	SM, SP-SM	A-2-4, A-3	0	0-1	90-100	85-100	80-100	9-25	16-25	NP-3	
	6-29	Fine sand, loamy fine sand	SM, SP-SM	A-2, A-3	0	0-1	90-100	85-100	80-100	9-25	16-25	NP-3	
	29-63	Sandy clay loam, loam, fine sandy loam	CL, CL-ML, SC, SC-SM	A-2-4, A-2-6, A-4, A-6	0	0-1	90-100	85-100	75-100	30-55	20-43	4-26	
	63-80	Sandy clay loam, loam, fine sandy loam	CL, CL-ML, SC, SC-SM	A-2-4, A-2-6, A-4, A-6	0	0-1	90-100	80-100	70-100	22-55	20-43	4-25	
SnD: Silstid-----	0-5	Loamy fine sand	SM, SP-SM	A-2-4, A-3	0	0-1	90-100	85-100	80-100	9-25	16-25	NP-3	
	5-27	Fine sand, loamy fine sand	SM, SP-SM	A-2, A-3	0	0-1	90-100	85-100	80-100	9-25	16-25	NP-3	
	27-45	Sandy clay loam, loam, fine sandy loam	CL, CL-ML, SC, SC-SM	A-2-4, A-2-6, A-4, A-6	0	0-1	90-100	85-100	75-100	30-55	20-43	4-26	
	45-80	Sandy clay loam, loam, fine sandy loam	CL, CL-ML, SC, SC-SM	A-2-4, A-2-6, A-4, A-6	0	0-1	90-100	80-100	70-100	22-55	20-43	4-25	

Table 13.--Engineering Index Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--				Liquid limit	Plas- ticity index
			Unified	AASHTO	>10 inches	3-10 inches	4	10	40	200		
	<u>In</u>				<u>Pct</u>	<u>Pct</u>					<u>Pct</u>	
SpB: Spiller-----												
	0-12	Fine sandy loam	SC, SC-SM, SM	A-2-4, A-4	0	0	100	95-100	80-100	20-50	16-25	NP-8
	12-53	Sandy clay, clay loam, clay	CH, CL, SC	A-7-6	0	0	100	95-100	90-100	40-70	41-55	18-28
	53-59	Sandy clay, clay loam, sandy clay loam	CL, SC	A-2-7, A-6, A-7-6	0	0	100	95-100	85-100	30-70	30-49	11-25
TaA: Tabor-----												
	59-80	Fine sandy loam, sandy clay loam, sandy clay	CH, CL, CL-ML, SC	A-2, A-4, A-6, A-7-6	0	0	100	95-100	80-100	20-60	26-55	5-28
	0-17	Fine sandy loam	CL-ML, ML, SC-SM, SM	A-2-4, A-4	0	0	85-100	75-100	70-100	30-55	15-25	NP-7
	17-58 58-80	Clay Sandy clay loam, clay loam, clay	CH, CL CH, CL, SC	A-7 A-6, A-7	0 0	0 0	95-100 95-100	90-100 90-100	85-100 75-100	55-90 40-90	45-65 35-60	25-40 15-35
Uh: Uhland-----												
	0-3	Loam	CL, ML, SC, SM	A-4, A-6	0	0	97-100	97-100	80-100	36-70	22-35	3-13
	3-48	Fine sandy loam, loam, very fine sandy loam	SC, SM, CL, ML	A-4, A-6	0	0	97-100	95-100	80-100	36-78	18-36	3-18
	48-80	Loam, clay loam	CL	A-4, A-6, A-7	0	0	97-100	95-100	80-100	50-90	28-43	9-21
W. Water												
WeA: Weswood-----												
	0-4 4-64	Silt loam Very fine sandy loam, silty clay loam, silt loam	CL, CL-ML CL, CL-ML	A-4, A-6 A-4, A-6	0 0	0 0	100 100	98-100 98-100	90-100 95-100	65-95 70-98	20-35 20-40	5-18 5-22
	64-80	Silty clay loam, silty clay	CH, CL	A-7-6	0	0	100	98-100	95-100	75-100	40-60	22-40

Soil Survey of Robertson County, Texas

Table 13.--Engineering Index Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--					Liquid limit	Plas- ticity index
			Unified	AASHTO	>10 inches	3-10 inches	4	10	40	200			
	<u>In</u>				<u>Pct</u>	<u>Pct</u>						<u>Pct</u>	
WwA: Weswood-----	0-7	Silty clay loam	CL	A-4, A-6	0	0	100	98-100	95-100	75-98	20-40	9-22	
	7-55	Very fine sandy loam, silty clay loam, silt loam	CL, CL-ML	A-4, A-6	0	0	100	98-100	95-100	70-98	20-40	5-22	
	55-80	Silty clay loam, silty clay	CH, CL	A-7-6	0	0	100	98-100	95-100	75-100	40-60	22-40	
WwB: Weswood-----	0-9	Silty clay loam	CL	A-4, A-6	0	0	100	98-100	95-100	75-98	20-40	9-22	
	9-80	Very fine sandy loam, silty clay loam, silt loam	CL, CL-ML	A-4, A-6	0	0	100	98-100	95-100	70-98	20-40	5-22	
Wx: Weswood-----	0-10	Silty clay loam	CL	A-4, A-6	0	0	100	98-100	95-100	75-98	20-40	9-22	
	10-38	Very fine sandy loam, silty clay loam, silt loam	CL, CL-ML	A-4, A-6	0	0	100	98-100	95-100	70-98	20-40	5-22	
	38-80	Silty clay loam, silty clay	CH, CL	A-7-6	0	0	100	98-100	95-100	75-100	40-60	22-40	
Yahola-----	0-10	Very fine sandy loam	CL, CL-ML, ML	A-4	0	0	100	100	95-100	65-85	0-31	NP-10	
	10-35	Fine sandy loam, loam, very fine sandy loam	CL, ML, SC, SM	A-4	0	0	100	95-100	90-100	36-85	0-30	NP-10	
	35-80	Stratified loamy fine sand to loam	CL, ML, SC, SM	A-2, A-4	0	0	100	95-100	90-100	15-85	0-30	NP-10	
Wy: Whitesboro-----	0-22	Clay loam	CL	A-6, A-7-6	0	0	100	98-100	85-100	70-90	30-47	11-27	
	22-29	Loam, clay loam, sandy clay loam	CL	A-6, A-7-6	0	0	100	98-100	85-100	65-91	30-47	11-27	
	29-80	Loam, clay loam, sandy clay loam	CL	A-6, A-7-6	0	0	100	98-100	85-100	60-85	30-47	11-27	

Table 13.--Engineering Index Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--				Liquid limit	Plas- ticity index
			Unified	AASHTO	>10 inches	3-10 inches	4	10	40	200		
	<u>In</u>				<u>Pct</u>	<u>Pct</u>					<u>Pct</u>	
WzA: Wilson-----	0-7	Loam	CL	A-6	0	0	95-100	85-100	80-100	60-96	26-38	11-20
	7-67	Silty clay, clay, clay loam	CH, CL	A-7-6	0	0	90-100	80-100	80-100	65-96	43-56	26-37
	67-80	Silty clay, clay, silty clay loam	CH, CL	A-6, A-7-6	0	0	95-100	90-100	85-100	70-96	38-65	24-48
YaA: Yahola-----	0-13	Fine sandy loam	CL-ML, ML, SC-SM, SM	A-4	0	0	100	95-100	90-100	36-60	0-26	NP-7
	13-44	Fine sandy loam, loam, very fine sandy loam	CL, ML, SC, SM	A-4	0	0	100	95-100	90-100	36-85	0-30	NP-10
	44-80	Stratified loamy fine sand to loam	CL, ML, SC, SM	A-2, A-4	0	0	100	95-100	90-100	15-85	0-30	NP-10
Zb: Zilaboy-----	0-9	Clay	CH	A-7	0	0	100	98-100	85-100	80-95	55-65	30-40
	9-80	Clay, silty clay	CH	A-7	0	0	100	98-100	85-100	80-95	55-65	30-40

Table 14.--Physical Properties of the Soils

(Entries under "Erosion factors--T" apply to the entire profile. Entries under "Wind erodibility group" and "Wind erodibility index" apply only to the surface layer. Absence of an entry indicates that data were not estimated)

Map symbol and soil name	Depth	Clay	Moist bulk density	Permea- bility (Ksat)	Available water capacity	Linear extensi- bility	Organic matter	Erosion factors			Wind erodi- bility group	Wind erodi- bility index
								Kw	Kf	T		
	In	Pct	g/cc	In/hr	In/in	Pct	Pct					
AaD: Arenosa-----	0-8 8-80	0-3 0-3	1.24-1.50 1.45-1.65	6-20 6-20	0.05-0.08 0.03-0.07	0.0-2.9 0.0-2.9	0.4-1.0 0.1-0.5	.15 .15	.15 .15	5 5	1	250
BaB: Bastrop-----	0-13 13-70 70-80	5-20 20-35 18-39	1.50-1.65 1.55-1.65 1.55-1.70	2-6 0.6-2 0.6-2	0.11-0.17 0.15-0.19 0.12-0.16	0.0-2.9 0.0-2.9 0.0-2.9	0.5-1.0 0.3-1.0 0.1-0.5	.37 .32 .32	.37 .32 .32	5 5 5	3	86
BeB: Benchley-----	0-13 13-20 20-64 64-80	20-29 30-45 35-55 40-55	1.30-1.45 1.45-1.60 1.55-1.65 1.40-1.70	0.6-2 0.06-0.2 0.06-0.2 0.06-0.2	0.12-0.20 0.12-0.18 0.12-0.18 0.05-0.12	3.0-5.9 6.0-8.9 6.0-8.9 3.0-5.9	1.0-3.0 1.0-2.0 0.5-1.0 0.1-0.5	.32 .32 .32 .32	.32 .32 .32 .32	5 5 5 5	6	48
BeC: Benchley-----	0-10 10-18 18-62 62-80	20-29 30-45 35-55 40-55	1.30-1.45 1.45-1.60 1.55-1.65 1.40-1.70	0.6-2 0.06-0.2 0.06-0.2 0.06-0.2	0.12-0.20 0.12-0.18 0.12-0.18 0.05-0.12	3.0-5.9 6.0-8.9 6.0-8.9 3.0-5.9	1.0-3.0 1.0-2.0 0.5-1.0 0.1-0.5	.32 .32 .32 .32	.32 .32 .32 .32	5 5 5 5	6	48
BrB: Bremond-----	0-7 7-14 14-65 65-80	10-18 40-50 30-50 27-50	1.45-1.60 1.35-1.50 1.40-1.65 1.40-1.65	0.6-2 0.0015-0.06 0.0015-0.06 0.0015-0.06	0.11-0.20 0.14-0.18 0.15-0.18 0.15-0.18	0.0-2.9 6.0-8.9 6.0-8.9 6.0-8.9	1.0-2.0 0.5-1.0 0.5-1.0 0.1-0.5	.43 .32 .32 .32	.43 .32 .32 .32	5 5 5 5	5	56
BsA: Bremond-----	0-8 8-15 15-65 65-80	10-18 40-50 30-50 27-50	1.45-1.60 1.35-1.50 1.40-1.65 1.40-1.65	0.6-2 0.0015-0.06 0.0015-0.06 0.0015-0.06	0.11-0.20 0.14-0.18 0.15-0.18 0.15-0.18	0.0-2.9 6.0-8.9 6.0-8.9 6.0-8.9	1.0-2.0 0.5-1.0 0.5-1.0 0.1-0.5	.43 .32 .32 .32	.43 .32 .32 .32	5 5 5 5	5	56
Wilson-----	0-6 6-52 52-80	27-35 35-50 35-60	1.35-1.50 1.50-1.60 1.50-1.60	0.2-0.6 0.0015-0.06 0.0015-0.06	0.10-0.17 0.10-0.16 0.10-0.16	3.0-5.9 6.0-8.9 6.0-8.9	0.5-2.0 0.5-2.0 0.1-0.5	.43 .37 .37	.43 .37 .37	5 5 5	6	48
BuA: Burleson-----	0-7 7-68 68-80	40-60 40-60 35-60	1.35-1.50 1.40-1.55 1.40-1.55	0.0015-0.06 0.0015-0.06 0.0015-0.06	0.12-0.18 0.12-0.18 0.12-0.18	9.0-25.0 9.0-25.0 9.0-25.0	1.0-3.0 0.5-2.0 0.1-1.0	.32 .32 .32	.32 .32 .32	5 5 5	4	86

Table 14.—Physical Properties of the Soils—Continued

Map symbol and soil name	Depth	Clay	Moist bulk density	Permea- bility (Ksat)	Available water capacity	Linear extensi- bility	Organic matter	Erosion factors			Wind erodi- bility group	Wind index
								Kw	Kf	T		
	In	Pct	g/cc	In/hr	In/in	Pct	Pct					
CaA: Cadelake-----	0-8	5-10	1.10-1.40	2-6	0.10-0.15	0.0-2.9	1.0-6.0	.24	.24	5	3	86
	8-18	1-8	1.10-1.40	6-20	0.07-0.12	0.0-2.9	1.0-6.0	.17	.17			
	18-80	1-8	1.40-1.60	6-20	0.05-0.08	0.0-2.9	0.1-0.5	.15	.15			
ChC: Chazos-----	0-14	2-12	1.40-1.60	2-6	0.06-0.10	0.0-2.9	0.5-1.0	.20	.20	5	2	134
	14-22	35-50	1.35-1.50	0.06-0.2	0.10-0.18	3.0-5.9	0.5-1.0	.32	.32			
	22-35	20-40	1.35-1.55	0.06-0.2	0.10-0.18	3.0-5.9	0.3-1.0	.32	.32			
	35-80	27-45	1.40-1.60	0.06-0.2	0.10-0.18	3.0-5.9	0.1-0.5	.32	.32			
CoA: Coarsewood-----	0-5	8-18	1.18-1.40	2-6	0.11-0.15	0.0-2.9	0.5-2.0	.43	.43	5	4L	86
	5-44	8-18	1.18-1.40	2-6	0.11-0.15	0.0-2.9	0.5-1.0	.43	.43			
	44-80	6-18	1.18-1.40	2-6	0.11-0.15	0.0-2.9	0.5-1.0	.43	.43			
CoB: Coarsewood-----	0-7	8-18	1.18-1.40	2-6	0.11-0.15	0.0-2.9	0.5-2.0	.43	.43	5	4L	86
	7-46	8-18	1.18-1.40	2-6	0.11-0.15	0.0-2.9	0.5-1.0	.43	.43			
	46-80	6-18	1.18-1.40	2-6	0.11-0.15	0.0-2.9	0.5-1.0	.43	.43			
CrB: Crockett-----	0-7	5-20	1.50-1.60	0.6-2	0.11-0.20	0.0-2.9	0.5-2.0	.43	.43	5	5	56
	7-26	40-55	1.35-1.60	0.0015-0.06	0.08-0.14	6.0-8.9	0.2-0.5	.32	.32			
	26-48	35-55	1.40-1.65	0.0015-0.06	0.08-0.14	6.0-8.9	0.2-0.5	.32	.32			
	48-55	20-50	1.50-1.70	0.0015-0.06	0.11-0.15	3.0-5.9	0.1-0.5	.32	.32			
	55-80	30-60	1.50-1.70	0.0015-0.06	0.11-0.15	6.0-8.9	0.1-0.5	.32	.32			
CrC2: Crockett-----	0-3	5-20	1.50-1.60	0.6-2	0.11-0.20	0.0-2.9	0.5-2.0	.43	.43	5	5	56
	3-12	40-55	1.35-1.60	0.0015-0.06	0.08-0.14	6.0-8.9	0.2-0.5	.32	.32			
	12-43	35-55	1.40-1.65	0.0015-0.06	0.08-0.14	6.0-8.9	0.2-0.5	.32	.32			
	43-52	20-50	1.50-1.70	0.0015-0.06	0.11-0.15	3.0-5.9	0.1-0.5	.32	.32			
	52-80	30-60	1.50-1.70	0.0015-0.06	0.11-0.15	6.0-8.9	0.1-0.5	.32	.32			
DfC: Desan-----	0-10	2-12	1.30-1.60	6-20	0.05-0.08	0.0-2.9	0.3-1.0	.20	.20	5	2	134
	10-62	2-12	1.30-1.60	6-20	0.05-0.08	0.0-2.9	0.3-1.0	.17	.17			
	62-80	12-25	1.35-1.65	0.6-2	0.12-0.16	0.0-2.9	0.1-0.5	.24	.17			
DmB: Dimebox-----	0-7	40-60	1.25-1.40	0.0015-0.06	0.12-0.18	9.0-25.0	1.0-5.0	.32	.32	5	4	86
	7-63	40-60	1.25-1.40	0.0015-0.06	0.12-0.18	9.0-25.0	1.0-5.0	.32	.32			
	63-80	40-60	1.25-1.40	0.0015-0.06	0.12-0.18	9.0-25.0	0.5-2.0	.32	.32			

Table 14.--Physical Properties of the Soils--Continued

Map symbol and soil name	Depth	Clay	Moist bulk density	Permea- bility (Ksat)	Available water capacity	Linear extensi- bility	Organic matter	Erosion factors			Wind erodi- bility group	Wind erodi- bility index
								Kw	Kf	T		
	In	Pct	g/cc	In/hr	In/in	Pct	Pct					
DuB: Dutek-----	0-17	3-12	1.30-1.60	6-20	0.05-0.10	0.0-2.9	0.5-1.0	.20	.20	5	2	134
	17-27	3-12	1.30-1.60	6-20	0.05-0.10	0.0-2.9	0.5-1.0	.20	.20			
	27-51	18-35	1.30-1.65	0.6-2	0.12-0.17	0.0-2.9	0.5-1.0	.24	.24			
	51-58	10-30	1.30-1.65	0.6-6	0.10-0.16	0.0-2.9	0.3-1.0	.24	.24			
	58-80	5-20	1.30-1.60	2-20	0.05-0.10	0.0-2.9	0.1-0.5	.20	.20			
DuD: Dutek-----	0-6	3-12	1.30-1.60	6-20	0.05-0.10	0.0-2.9	0.5-1.0	.20	.20	5	2	134
	6-22	3-12	1.30-1.60	6-20	0.05-0.10	0.0-2.9	0.5-1.0	.20	.20			
	22-58	18-35	1.30-1.65	0.6-2	0.12-0.17	0.0-2.9	0.5-1.0	.24	.24			
	58-68	10-30	1.30-1.65	0.6-6	0.10-0.16	0.0-2.9	0.3-1.0	.24	.24			
	68-80	5-20	1.30-1.60	2-20	0.05-0.10	0.0-2.9	0.1-0.5	.20	.20			
EdC: Edge-----	0-12	5-12	1.25-1.55	0.6-2	0.14-0.18	0.0-2.9	0.5-1.0	.43	.43	5	3	86
	12-34	40-55	1.36-1.55	0.0015-0.06	0.11-0.19	6.0-8.9	0.5-1.0	.32	.32			
	34-50	35-45	1.45-1.65	0.06-0.2	0.10-0.16	3.0-5.9	0.5-1.0	.32	.32			
	50-74	10-40	1.40-1.69	0.2-0.6	0.10-0.16	3.0-5.9	0.3-0.7	.37	.37			
	74-80	10-45	1.50-1.75	0.06-0.2	0.11-0.18	3.0-5.9	0.1-0.5	.37	.37			
EdC2: Edge-----	0-4	5-12	1.25-1.55	0.6-2	0.14-0.18	0.0-2.9	0.5-1.0	.43	.43	5	3	86
	4-41	40-55	1.36-1.55	0.0015-0.06	0.11-0.19	6.0-8.9	0.5-1.0	.32	.32			
	41-47	35-45	1.45-1.65	0.06-0.2	0.10-0.16	3.0-5.9	0.5-1.0	.32	.32			
	47-80	10-45	1.50-1.75	0.06-0.2	0.11-0.18	3.0-5.9	0.1-0.5	.37	.37			
EdD2: Edge-----	0-4	5-12	1.25-1.55	0.6-2	0.14-0.18	0.0-2.9	0.5-1.0	.43	.43	5	3	86
	4-24	40-55	1.36-1.55	0.0015-0.06	0.11-0.19	6.0-8.9	0.5-1.0	.32	.32			
	24-43	35-45	1.45-1.65	0.06-0.2	0.10-0.16	3.0-5.9	0.5-1.0	.32	.32			
	43-64	10-40	1.40-1.69	0.2-0.6	0.10-0.16	3.0-5.9	0.3-0.7	.37	.37			
	64-80	10-45	1.50-1.75	0.06-0.2	0.11-0.18	3.0-5.9	0.1-0.5	.37	.37			
EgD: Edge-----	0-5	5-12	1.25-1.55	0.6-2	0.14-0.18	0.0-2.9	0.5-1.0	.43	.43	5	3	86
	5-45	40-55	1.36-1.55	0.0015-0.06	0.11-0.19	6.0-8.9	0.5-1.0	.32	.32			
	45-54	35-45	1.45-1.65	0.06-0.2	0.10-0.16	3.0-5.9	0.5-1.0	.32	.32			
	54-80	10-45	1.50-1.75	0.06-0.2	0.11-0.18	3.0-5.9	0.1-0.5	.37	.37			
Gullied land.												
EuC: Eufaula-----	0-31	2-10	1.45-1.65	6-20	0.07-0.11	0.0-2.9	0.5-1.0	.17	.17	5	2	134
	31-80	2-10	1.45-1.65	6-20	0.05-0.11	0.0-2.9	0.0-0.5	.15	.15			

Table 14.—Physical Properties of the Soils—Continued

Map symbol and soil name	Depth	Clay	Moist bulk density	Permea- bility (Ksat)	Available water capacity	Linear extensi- bility	Organic matter	Erosion factors			Wind erodi- bility group	Wind index
								Kw	Kf	T		
	In	Pct	g/cc	In/hr	In/in	Pct	Pct					
Ga: Gaddy-----	0-9	3-10	1.35-1.50	6-20	0.07-0.11	0.0-2.9	0.1-0.5	.17	.17	5	2	134
	9-80	5-15	1.50-1.70	6-20	0.06-0.10	0.0-2.9	0.1-1.0	.17	.17			
GsB: Gasil-----	0-15	5-12	1.50-1.60	6-20	0.07-0.11	0.0-2.9	0.5-1.0	.20	.20	5	2	134
	15-80	15-35	1.40-1.60	0.6-2	0.12-0.19	0.0-2.9	0.1-0.5	.32	.32			
GsD: Gasil-----	0-11	5-12	1.50-1.60	6-20	0.07-0.11	0.0-2.9	0.5-1.0	.20	.20	5	2	134
	11-80	15-35	1.40-1.60	0.6-2	0.12-0.19	0.0-2.9	0.1-0.5	.32	.32			
HaB: Hammond-----	0-8	15-20	1.30-1.65	0.2-0.6	0.11-0.15	0.0-2.9	1.0-2.0	.32	.32	5	3	86
	8-80	20-39	1.30-1.50	0.06-0.2	0.12-0.18	3.0-5.9	0.1-0.5	.37	.37			
HaE: Hammond-----	0-6	15-20	1.30-1.65	0.2-0.6	0.11-0.15	0.0-2.9	1.0-2.0	.32	.32	5	3	86
	6-80	20-39	1.30-1.50	0.06-0.2	0.12-0.18	3.0-5.9	0.1-0.5	.37	.37			
HeD: Hearne-----	0-10	2-15	1.20-1.40	2-6	0.11-0.17	0.0-2.9	0.5-1.0	.32	.28	4	3	86
	10-25	35-60	1.30-1.50	0.06-0.2	0.10-0.15	3.0-5.9	0.2-1.0	.32	.32			
	25-80	20-45	1.40-1.65	0.06-0.6	0.08-0.15	3.0-5.9	0.1-0.5	.32	.32			
HeE: Hearne-----	0-5	2-15	1.20-1.40	2-6	0.11-0.17	0.0-2.9	0.5-1.0	.32	.28	4	3	86
	5-29	35-60	1.30-1.50	0.06-0.2	0.10-0.15	3.0-5.9	0.2-1.0	.32	.32			
	29-80	20-45	1.40-1.65	0.06-0.6	0.08-0.15	3.0-5.9	0.1-0.5	.32	.32			
HnD: Hearne-----	0-1	2-15	1.20-1.40	2-6	0.11-0.17	0.0-2.9	0.5-1.0	.28	.28	3	8	0
	1-24	35-60	1.30-1.50	0.06-0.2	0.10-0.15	3.0-5.9	0.2-1.0	.32	.32			
	24-80	20-45	1.40-1.65	0.06-0.6	0.08-0.15	3.0-5.9	0.1-0.5	.32	.32			
HnE: Hearne-----	0-13	5-20	1.30-1.60	2-6	0.08-0.12	0.0-2.9	0.5-1.0	.10	.24	4	8	0
	13-36	40-60	1.30-1.50	0.06-0.2	0.10-0.15	3.0-5.9	0.2-0.5	.32	.32			
	36-80	20-45	1.40-1.65	0.06-0.6	0.08-0.15	3.0-5.9	0.1-0.5	.32	.32			
HrD: Hearne-----	0-9	2-15	1.30-1.60	2-6	0.10-0.14	0.0-2.9	0.5-1.0	.20	.28	4	8	0
	9-28	35-60	1.30-1.50	0.06-0.2	0.10-0.15	3.0-5.9	0.2-1.0	.32	.32			
	28-80	20-45	1.40-1.65	0.06-0.6	0.08-0.15	3.0-5.9	0.1-0.5	.32	.32			

Table 14.--Physical Properties of the Soils--Continued

Map symbol and soil name	Depth	Clay	Moist bulk density	Permea- bility (Ksat)	Available water capacity	Linear extensi- bility	Organic matter	Erosion factors			Wind erodi- bility group	Wind index
								Kw	Kf	T		
	In	Pct	g/cc	In/hr	In/in	Pct	Pct					
HsA: Highbank-----	0-17	20-40	1.40-1.50	0.6-2	0.17-0.22	3.0-5.9	1.0-3.0	.32	.32	5	4	86
	17-44	40-50	1.25-1.40	0.06-0.2	0.14-0.20	6.0-8.9	0.5-1.0	.32	.32			
	44-80	30-50	1.30-1.45	0.06-0.2	0.14-0.20	6.0-8.9	0.3-1.0	.32	.32			
LeC: Lexton-----	0-6	25-40	1.20-1.50	0.6-2	0.12-0.17	0.0-2.9	0.5-2.0	.32	.32	5	5	56
	6-55	35-55	1.20-1.50	0.2-0.6	0.12-0.18	3.0-5.9	0.2-0.5	.32	.32			
	55-80	---	---	0.2-2	---	---	0.1-0.5	---	---			
LeE: Lexton-----	0-5	25-40	1.20-1.50	0.6-2	0.12-0.17	0.0-2.9	0.5-2.0	.32	.32	5	5	56
	5-52	35-55	1.20-1.50	0.2-0.6	0.12-0.18	3.0-5.9	0.2-0.5	.32	.32			
	52-80	---	---	0.2-2	---	---	0.1-0.5	---	---			
LfA: Lufkin-----	0-9	5-18	1.35-1.65	0.6-2	0.11-0.18	0.0-2.9	0.5-2.0	.43	.43	5	3	86
	9-80	35-50	1.40-1.60	0.0015-0.06	0.09-0.14	9.0-25.0	0.1-1.0	.32	.32			
LuB: Luling-----	0-13	40-55	1.20-1.35	0.0015-0.06	0.12-0.18	6.0-8.9	1.0-3.0	.32	.32	5	4	86
	13-52	40-55	1.25-1.40	0.0015-0.06	0.12-0.18	9.0-25.0	0.5-2.0	.32	.32			
	52-64	40-55	1.30-1.45	0.0015-0.06	0.12-0.18	9.0-25.0	0.1-1.0	.32	.32			
	64-80	40-55	1.45-1.60	0.0015-0.06	0.09-0.12	9.0-25.0	0.1-1.0	.32	.32			
LuC: Luling-----	0-8	40-55	1.20-1.35	0.0015-0.06	0.12-0.18	6.0-8.9	1.0-3.0	.32	.32	5	4	86
	8-40	40-55	1.25-1.40	0.0015-0.06	0.12-0.18	9.0-25.0	0.5-2.0	.32	.32			
	40-62	40-55	1.30-1.45	0.0015-0.06	0.12-0.18	9.0-25.0	0.1-1.0	.32	.32			
	62-80	40-55	1.45-1.60	0.0015-0.06	0.09-0.12	9.0-25.0	0.1-1.0	.32	.32			
MgB: Margie-----	0-6	6-18	1.40-1.60	0.6-2	0.08-0.12	0.0-2.9	1.0-2.0	.37	.37	4	3	86
	6-28	30-50	1.45-1.65	0.2-0.6	0.12-0.18	3.0-5.9	0.1-1.0	.32	.32			
	28-66	40-55	1.45-1.65	0.2-0.6	0.06-0.11	3.0-5.9	0.1-1.0	.15	.32			
	66-72	25-45	1.50-1.70	0.2-0.6	0.12-0.17	3.0-5.9	0.1-1.0	.32	.32			
	72-80	---	---	0.06-2	---	---	---	---	---			
Na: Navasota-----	0-7	35-55	1.20-1.40	0.06-0.2	0.15-0.20	9.0-25.0	1.0-3.0	.32	.32	5	4	86
	7-69	40-55	1.20-1.40	0.0015-0.06	0.15-0.18	9.0-25.0	0.5-2.0	.32	.32			
	69-80	35-55	1.30-1.50	0.0015-0.06	0.15-0.18	9.0-25.0	0.3-0.5	.32	.32			
Nd: Navasota-----	0-11	35-55	1.20-1.40	0.06-0.2	0.15-0.20	9.0-25.0	1.0-3.0	.32	.32	5	4	86
	11-61	40-55	1.20-1.40	0.0015-0.06	0.15-0.18	9.0-25.0	0.5-2.0	.32	.32			
	61-80	40-55	1.30-1.50	0.0015-0.06	0.15-0.18	9.0-25.0	0.3-0.5	.32	.32			

Table 14.—Physical Properties of the Soils—Continued

Map symbol and soil name	Depth	Clay	Moist bulk density	Permea- bility (Ksat)	Available water capacity	Linear extensi- bility	Organic matter	Erosion factors			Wind erodi- bility group	Wind erodi- bility index
								Kw	Kf	T		
	In	Pct	g/cc	In/hr	In/in	Pct	Pct					
Ot: Oletha-----	0-6	40-50	1.25-1.45	0.0015-0.06	0.14-0.19	6.0-8.9	1.0-3.0	.32	.32	5	4	86
	6-39	24-35	1.35-1.60	0.2-2	0.15-0.18	3.0-5.9	1.0-3.0	.32	.32			
	39-50	25-35	1.35-1.60	0.2-2	0.15-0.18	3.0-5.9	0.5-1.0	.32	.32			
	50-72	25-35	1.35-1.60	0.2-2	0.15-0.18	3.0-5.9	0.5-1.0	.32	.32			
	72-80	15-35	1.40-1.60	0.2-2	0.15-0.18	3.0-5.9	0.5-1.0	.32	.32			
PaC: Padina-----	0-5	2-10	1.20-1.50	6-20	0.07-0.11	0.0-2.9	0.5-1.0	.17	.17	5	2	134
	5-56	2-10	1.20-1.50	6-20	0.05-0.08	0.0-2.9	0.1-0.5	.17	.17			
	56-80	18-30	1.40-1.60	0.6-2	0.14-0.18	0.0-2.9	0.1-0.5	.24	.24			
PaE: Padina-----	0-5	2-10	1.20-1.50	6-20	0.07-0.11	0.0-2.9	0.5-1.0	.17	.17	5	2	134
	5-53	2-10	1.20-1.50	6-20	0.05-0.08	0.0-2.9	0.1-0.5	.17	.17			
	53-80	18-30	1.40-1.60	0.6-2	0.14-0.18	0.0-2.9	0.1-0.5	.24	.24			
Pt. Pits and Dumps												
RaA: Rader-----	0-14	4-15	1.30-1.50	2-6	0.10-0.18	0.0-2.9	0.5-2.0	.37	.37	5	3	86
	14-21	4-15	1.35-1.55	2-6	0.10-0.18	0.0-2.9	0.5-1.0	.37	.37			
	21-24	18-30	1.40-1.60	0.2-0.6	0.10-0.18	3.0-5.9	0.5-1.0	.32	.32			
	24-49	35-50	1.45-1.65	0.0015-0.06	0.10-0.18	6.0-8.9	0.3-0.5	.32	.32			
	49-80	24-45	1.45-1.65	0.06-0.2	0.10-0.18	3.0-5.9	0.1-0.5	.32	.32			
RoB: Robco-----	0-16	2-10	1.40-1.60	6-20	0.04-0.10	0.0-2.9	0.5-1.0	.24	.24	5	2	134
	16-29	2-10	1.40-1.60	6-20	0.04-0.10	0.0-2.9	0.5-1.0	.24	.24			
	29-34	27-35	1.50-1.65	0.2-0.6	0.12-0.18	3.0-5.9	0.5-1.0	.32	.32			
	34-40	20-35	1.55-1.70	0.06-0.2	0.12-0.18	6.0-8.9	0.3-1.0	.37	.37			
	40-80	25-45	1.55-1.70	0.06-0.2	0.10-0.18	3.0-5.9	0.1-0.5	.37	.37			
Rr: Roetex-----	0-17	55-75	1.10-1.25	0.0015-0.06	0.12-0.18	9.0-25.0	1.0-3.0	.32	.32	5	4	86
	17-55	60-75	1.20-1.35	0.0015-0.06	0.12-0.18	9.0-25.0	0.5-2.0	.32	.32			
	55-80	35-60	1.25-1.40	0.0015-0.06	0.12-0.18	9.0-25.0	0.1-0.5	.32	.32			
RsC: Rosanky-----	0-7	5-18	1.20-1.40	0.6-2	0.10-0.14	0.0-2.9	0.5-2.0	.28	.28	5	3	86
	7-39	35-50	1.40-1.60	0.2-0.6	0.11-0.17	3.0-5.9	0.1-0.5	.32	.32			
	39-80	15-35	1.40-1.65	0.2-0.6	0.10-0.16	0.0-2.9	0.1-0.5	.37	.37			

Table 14.--Physical Properties of the Soils--Continued

Map symbol and soil name	Depth	Clay	Moist bulk density	Permea- bility (Ksat)	Available water capacity	Linear extensi- bility	Organic matter	Erosion factors			Wind erodi- bility group	Wind erodi- bility index
								Kw	Kf	T		
	In	Pct	g/cc	In/hr	In/in	Pct	Pct					
RsD: Rosanky-----	0-6	5-18	1.20-1.40	0.6-2	0.10-0.14	0.0-2.9	0.5-2.0	.28	.28	5	3	86
	6-36	35-50	1.40-1.60	0.2-0.6	0.11-0.17	3.0-5.9	0.1-0.5	.32	.32			
	36-80	15-35	1.40-1.65	0.2-0.6	0.10-0.16	0.0-2.9	0.1-0.5	.37	.37			
RvC2: Rosanky-----	0-4	5-18	1.20-1.40	0.6-2	0.10-0.14	0.0-2.9	0.5-2.0	.28	.28	5	3	86
	4-35	35-50	1.40-1.60	0.2-0.6	0.11-0.17	3.0-5.9	0.1-0.5	.32	.32			
	35-80	15-35	1.40-1.65	0.2-0.6	0.10-0.16	0.0-2.9	0.1-0.5	.37	.37			
Sa: Sandow-----	0-9	15-25	1.25-1.35	0.6-2	0.12-0.18	0.0-2.9	1.0-4.0	.37	.37	5	5	56
	9-80	10-35	1.30-1.60	0.2-0.6	0.12-0.17	3.0-5.9	0.1-2.0	.32	.32			
ShA: Ships-----	0-6	60-80	1.20-1.40	0.0015-0.06	0.12-0.18	9.0-25.0	0.5-3.0	.32	.32	5	4	86
	6-70	60-80	1.20-1.40	0.0015-0.06	0.12-0.18	9.0-25.0	0.5-2.0	.32	.32			
	70-80	35-80	1.25-1.50	0.0015-0.06	0.12-0.18	9.0-25.0	0.5-1.0	.32	.32			
ShB: Ships-----	0-15	60-80	1.20-1.40	0.0015-0.06	0.12-0.18	9.0-25.0	0.5-3.0	.32	.32	5	4	86
	15-65	60-80	1.20-1.40	0.0015-0.06	0.12-0.18	9.0-25.0	0.5-2.0	.32	.32			
	65-80	35-80	1.25-1.50	0.0015-0.06	0.12-0.18	9.0-25.0	0.5-1.0	.32	.32			
Sk: Ships-----	0-10	60-80	1.20-1.40	0.0015-0.06	0.12-0.18	9.0-25.0	0.5-3.0	.32	.32	5	4	86
	10-65	60-80	1.20-1.40	0.0015-0.06	0.12-0.18	9.0-25.0	0.5-2.0	.32	.32			
	65-80	35-80	1.25-1.50	0.0015-0.06	0.12-0.18	9.0-25.0	0.5-1.0	.32	.32			
SmC: Silawa-----	0-15	5-15	1.20-1.45	6-20	0.07-0.11	0.0-2.9	0.5-2.0	.20	.20	5	2	134
	15-41	18-35	1.35-1.60	0.6-2	0.12-0.17	0.0-2.9	0.1-1.0	.32	.32			
	41-57	12-30	1.40-1.65	2-6	0.08-0.15	0.0-2.9	0.1-0.7	.32	.28			
	57-80	2-15	1.40-1.70	6-20	0.05-0.11	0.0-2.9	0.1-0.5	.20	.24			
SmD: Silawa-----	0-14	5-15	1.20-1.45	6-20	0.07-0.11	0.0-2.9	0.5-2.0	.20	.20	5	2	134
	14-43	18-35	1.35-1.60	0.6-2	0.12-0.17	0.0-2.9	0.1-1.0	.32	.32			
	43-48	12-30	1.40-1.65	2-6	0.08-0.15	0.0-2.9	0.1-0.7	.32	.28			
	48-80	2-15	1.40-1.70	6-20	0.05-0.11	0.0-2.9	0.1-0.5	.20	.24			
SnB: Silstid-----	0-6	3-12	1.40-1.60	6-20	0.05-0.10	0.0-2.9	0.5-1.0	.17	.17	5	2	134
	6-29	3-12	1.40-1.60	6-20	0.05-0.10	0.0-2.9	0.5-1.0	.17	.17			
	29-63	18-32	1.50-1.70	0.6-2	0.10-0.16	0.0-2.9	0.3-1.0	.24	.24			
	63-80	18-32	1.50-1.70	0.6-2	0.10-0.16	0.0-2.9	0.1-0.5	.24	.28			

Table 14.--Physical Properties of the Soils--Continued

Map symbol and soil name	Depth	Clay	Moist bulk density	Permea- bility (Ksat)	Available water capacity	Linear extensi- bility	Organic matter	Erosion factors			Wind erodi- bility group	Wind erodi- bility index
								Kw	Kf	T		
	In	Pct	g/cc	In/hr	In/in	Pct	Pct					
SnD: Silstid-----	0-5	3-12	1.40-1.60	6-20	0.05-0.10	0.0-2.9	0.5-1.0	.17	.17	5	2	134
	5-27	3-12	1.40-1.60	6-20	0.05-0.10	0.0-2.9	0.5-1.0	.17	.17			
	27-45	18-32	1.50-1.70	0.6-2	0.10-0.16	0.0-2.9	0.3-1.0	.24	.24			
	45-80	18-32	1.50-1.70	0.6-2	0.10-0.16	0.0-2.9	0.1-0.5	.24	.28			
SpB: Spiller-----	0-12	10-20	1.40-1.60	2-6	0.11-0.15	0.0-2.9	0.5-1.0	.28	.28	5	3	86
	12-53	35-45	1.40-1.65	0.06-0.2	0.12-0.18	3.0-5.9	0.2-1.0	.32	.32			
	53-59	20-40	1.40-1.65	0.2-0.6	0.12-0.18	3.0-5.9	0.2-0.5	.32	.32			
	59-80	10-40	1.35-1.65	0.06-0.2	0.10-0.18	0.0-2.9	0.2-0.5	.32	.32			
TaA: Tabor-----	0-17	8-20	1.50-1.60	0.6-2	0.11-0.15	0.0-2.9	0.5-1.0	.43	.28	5	3	86
	17-58	40-55	1.35-1.55	0.0015-0.06	0.09-0.12	6.0-8.9	0.1-1.0	.32	.32			
	58-80	25-45	1.45-1.65	0.0015-0.06	0.14-0.18	6.0-8.9	0.1-0.5	.32	.32			
Uh: Uhland-----	0-3	10-20	1.25-1.40	0.6-2	0.10-0.16	0.0-2.9	1.0-4.0	.37	.37	5	3	86
	3-48	10-18	1.25-1.55	0.6-2	0.10-0.16	0.0-2.9	0.3-1.0	.37	.37			
	48-80	18-35	1.25-1.60	0.2-0.6	0.12-0.18	3.0-5.9	0.1-1.0	.32	.32			
W. Water												
WeA: Weswood-----	0-4	8-26	1.20-1.35	0.6-2	0.12-0.20	0.0-2.9	1.0-4.0	.43	.43	5	6	48
	4-64	10-20	1.30-1.55	0.6-2	0.12-0.20	0.0-2.9	1.0-4.0	.43	.43			
	64-80	27-45	1.30-1.55	0.2-0.6	0.13-0.18	3.0-5.9	1.0-4.0	.32	.32			
WwA: Weswood-----	0-7	27-35	1.20-1.35	0.6-2	0.12-0.20	0.0-2.9	1.0-4.0	.43	.43	5	6	48
	7-55	10-20	1.30-1.55	0.6-2	0.12-0.20	0.0-2.9	1.0-4.0	.43	.43			
	55-80	27-45	1.30-1.55	0.2-0.6	0.13-0.18	3.0-5.9	1.0-4.0	.32	.32			
WwB: Weswood-----	0-9	27-35	1.20-1.35	0.6-2	0.12-0.20	0.0-2.9	1.0-4.0	.43	.43	5	6	48
	9-80	10-20	1.30-1.55	0.6-2	0.12-0.20	0.0-2.9	1.0-4.0	.43	.43			
Wx: Weswood-----	0-10	27-35	1.20-1.35	0.6-2	0.12-0.20	0.0-2.9	1.0-4.0	.43	.43	5	6	48
	10-38	10-20	1.30-1.55	0.6-2	0.12-0.20	0.0-2.9	1.0-4.0	.43	.43			
	38-80	27-45	1.30-1.55	0.2-0.6	0.13-0.18	3.0-5.9	1.0-4.0	.32	.32			
Yahola-----	0-10	10-18	1.30-1.55	2-6	0.15-0.20	0.0-2.9	0.5-1.0	.32	.32	5	4L	86
	10-35	5-18	1.40-1.70	2-6	0.11-0.20	0.0-2.9	0.5-1.0	.32	.32			
	35-80	5-18	1.50-1.70	2-6	0.07-0.20	0.0-2.9	0.5-1.0	.32	.32			

Table 14.--Physical Properties of the Soils--Continued

Map symbol and soil name	Depth	Clay	Moist bulk density	Permea- bility (Ksat)	Available water capacity	Linear extensi- bility	Organic matter	Erosion factors			Wind erodi- bility group	Wind erodi- bility index
								Kw	Kf	T		
	In	Pct	g/cc	In/hr	In/in	Pct	Pct					
Wy: Whitesboro-----	0-22	20-35	1.25-1.35	0.6-2	0.13-0.18	3.0-5.9	1.0-3.0	.32	.32	5	5	56
	22-29	22-35	1.30-1.45	0.6-2	0.13-0.18	3.0-5.9	0.5-2.0	.28	.28			
	29-80	22-35	1.30-1.55	0.6-2	0.13-0.18	3.0-5.9	0.5-2.0	.28	.28			
WzA: Wilson-----	0-7	18-27	1.35-1.45	0.2-0.6	0.10-0.17	0.0-2.9	0.5-2.0	.43	.43	5	5	56
	7-67	35-50	1.50-1.60	0.0015-0.06	0.10-0.16	6.0-8.9	0.5-2.0	.37	.37			
	67-80	35-60	1.50-1.60	0.0015-0.06	0.10-0.16	6.0-8.9	0.1-0.5	.37	.37			
YaA: Yahola-----	0-13	10-18	1.30-1.60	2-6	0.11-0.15	0.0-2.9	0.5-1.0	.20	.20	5	3	86
	13-44	5-18	1.40-1.70	2-6	0.11-0.20	0.0-2.9	0.5-1.0	.32	.32			
	44-80	5-18	1.50-1.70	2-6	0.07-0.20	0.0-2.9	0.5-1.0	.32	.32			
Zb: Zilaboy-----	0-9	40-60	1.35-1.55	0.0015-0.06	0.12-0.18	6.0-8.9	1.0-3.0	.32	.32	5	4	86
	9-80	40-60	1.35-1.60	0.0015-0.06	0.12-0.18	6.0-8.9	0.5-1.0	.32	.32			

Soil Survey of Robertson County, Texas

Table 15.—Chemical Properties of the Soils

(Absence of an entry indicates that data were not estimated)

Map symbol and soil name	Depth	Cation exchange- capacity	Effective cation- exchange capacity	Soil reaction	Calcium carbon- ate	Gypsum	Salinity	Sodium adsorp- tion ratio
	In	meq/100 g	meq/100 g	pH	Pct	Pct	mmhos/cm	
AaD:								
Arenosa-----	0-8	1.0-4.0	---	4.5-6.5	0	0	0.0-2.0	0
	8-80	---	1.0-3.0	4.5-6.0	0	0	0.0-2.0	0
BaB:								
Bastrop-----	0-13	2.0-10	---	5.6-7.8	0	0	0.0-2.0	0
	13-70	10-20	---	5.6-8.4	0-5	0	0.0-2.0	0
	70-80	5.0-15	---	6.1-8.4	0-5	0	0.0-2.0	0
BeB:								
Benchley-----	0-13	15-30	---	5.6-7.3	0	0	0.0-2.0	0
	13-20	25-40	---	5.6-7.3	0-2	0	0.0-2.0	0
	20-64	25-45	---	5.6-8.4	0-10	0-2	0.0-2.0	0
	64-80	25-45	---	6.1-8.4	0-10	0-5	0.0-2.0	0-4
BeC:								
Benchley-----	0-10	15-30	---	5.6-7.3	0	0	0.0-2.0	0
	10-18	25-40	---	5.6-7.3	0-2	0	0.0-2.0	0
	18-62	25-45	---	5.6-8.4	0-10	0-2	0.0-2.0	0
	62-80	25-45	---	6.1-8.4	0-10	0-5	0.0-2.0	0-4
BrB:								
Bremond-----	0-7	5.0-15	---	5.1-7.3	0	0	0.0-2.0	0-3
	7-14	20-35	---	5.6-7.3	0	0	0.0-2.0	0-5
	14-65	20-35	---	6.1-8.4	0-2	0-5	0.0-2.0	2-8
	65-80	15-30	---	6.6-8.4	2-5	2-10	2.0-8.0	2-8
BsA:								
Bremond-----	0-8	5.0-15	---	5.1-7.3	0	0	0.0-2.0	0-3
	8-15	20-35	---	5.6-7.3	0	0	0.0-2.0	0-5
	15-65	20-35	---	6.1-8.4	0-2	0-5	0.0-2.0	2-8
	65-80	15-30	---	6.6-8.4	2-5	2-10	2.0-8.0	2-8
Wilson-----	0-6	20-30	---	5.6-7.3	0	0	0.0-2.0	0-2
	6-52	20-30	---	5.6-7.8	1-10	0-4	0.0-4.0	2-10
	52-80	20-30	---	6.6-8.4	1-20	2-15	2.0-8.0	4-13
BuA:								
Burleson-----	0-7	40-60	---	5.6-8.4	0-5	0	0.0-2.0	0
	7-68	40-60	---	5.6-8.4	2-8	0	0.0-4.0	0-1
	68-80	40-60	---	7.4-8.4	2-15	0	0.0-4.0	0-2
CaA:								
Cadelake-----	0-8	---	5.0-15	3.5-6.0	0	0	0.0-2.0	0
	8-18	---	1.0-5.0	3.5-6.0	0	0	0.0-2.0	0
	18-80	---	1.0-5.0	3.5-6.0	0	0	0.0-2.0	0
ChC:								
Chazos-----	0-14	2.0-7.0	---	5.6-7.3	0	0	0.0-2.0	0
	14-22	15-30	---	5.6-6.5	0	0	0.0-2.0	0-3
	22-35	15-30	---	5.6-7.3	0-5	0	0.0-2.0	0-5
	35-80	10-25	---	6.1-8.4	0-5	0	0.0-2.0	0-5
CoA:								
Coarsewood-----	0-5	5.0-15	---	7.4-8.4	7-15	0	0.0-2.0	0
	5-44	5.0-15	---	7.4-8.4	7-15	0	0.0-2.0	0
	44-80	5.0-15	---	7.4-8.4	6-15	0	0.0-2.0	0

Soil Survey of Robertson County, Texas

Table 15.—Chemical Properties of the Soils—Continued

Map symbol and soil name	Depth	Cation exchange- capacity	Effective cation- exchange capacity	Soil reaction	Calcium carbon- ate	Gypsum	Salinity	Sodium adsorp- tion ratio
	In	meq/100 g	meq/100 g	pH	Pct	Pct	mmhos/cm	
CoB:								
Coarsewood-----	0-7	5.0-15	---	7.4-8.4	7-15	0	0.0-2.0	0
	7-46	5.0-15	---	7.4-8.4	7-15	0	0.0-2.0	0
	46-80	5.0-15	---	7.4-8.4	6-15	0	0.0-2.0	0
CrB:								
Crockett-----	0-7	10-20	---	5.6-7.8	0	0	0.0-2.0	0-5
	7-26	20-35	---	5.6-7.3	0-2	0	0.0-4.0	3-10
	26-48	20-35	---	6.1-8.4	0-2	0	0.0-4.0	3-10
	48-55	20-35	---	6.1-8.4	5-30	0-2	0.0-4.0	3-10
	55-80	15-35	---	6.1-8.4	2-10	0-2	0.0-4.0	3-10
CrC2:								
Crockett-----	0-3	10-20	---	5.6-7.8	0	0	0.0-2.0	0-5
	3-12	20-35	---	5.6-7.3	0-2	0	0.0-4.0	3-10
	12-43	20-35	---	6.1-8.4	0-2	0	0.0-4.0	3-10
	43-52	20-35	---	6.1-8.4	5-30	0-2	0.0-4.0	3-10
	52-80	15-35	---	6.1-8.4	2-10	0-2	0.0-4.0	3-10
DAM.								
Dam								
DfC:								
Desan-----	0-10	1.0-5.0	---	5.1-7.3	0	0	0.0-2.0	0
	10-62	1.0-5.0	---	5.1-7.3	0	0	0.0-2.0	0
	62-80	5.0-12	---	5.1-6.5	0	0	0.0-2.0	0
DmB:								
Dimebox-----	0-7	30-50	---	4.5-7.3	0	0	0.0-2.0	0
	7-63	30-50	---	4.5-7.3	0-2	0-2	0.0-2.0	0-2
	63-80	20-40	---	5.1-8.4	0-15	0-5	0.0-2.0	0-4
DuB:								
Dutek-----	0-17	1.0-7.0	---	5.6-7.3	0	0	0.0-2.0	0
	17-27	1.0-5.0	---	5.6-7.3	0	0	0.0-2.0	0
	27-51	5.0-15	---	4.5-6.5	0	0	0.0-2.0	0
	51-58	5.0-15	---	4.5-7.3	0	0	0.0-2.0	0
	58-80	3.0-10	---	4.5-7.3	0	0	0.0-2.0	0
DuD:								
Dutek-----	0-6	1.0-7.0	---	5.6-7.3	0	0	0.0-2.0	0
	6-22	1.0-5.0	---	5.6-7.3	0	0	0.0-2.0	0
	22-58	5.0-15	---	4.5-6.5	0	0	0.0-2.0	0
	58-68	5.0-15	---	4.5-7.3	0	0	0.0-2.0	0
	68-80	3.0-10	---	4.5-7.3	0	0	0.0-2.0	0
EdC:								
Edge-----	0-12	2.0-10	---	4.5-7.3	0	0	0.0-2.0	0-2
	12-34	10-30	---	4.5-6.5	0	0	0.0-2.0	0-4
	34-50	10-30	---	4.5-6.5	0-2	0	0.0-2.0	0-4
	50-74	5.0-30	---	4.5-7.8	0-2	0	0.0-2.0	0-8
	74-80	5.0-30	---	5.1-8.4	0-2	0	0.0-2.0	0-10
EdC2:								
Edge-----	0-4	2.0-10	---	4.5-7.3	0	0	0.0-2.0	0-2
	4-41	10-30	---	4.5-6.5	0	0	0.0-2.0	0-4
	41-47	10-30	---	4.5-6.5	0-2	0	0.0-2.0	0-4
	47-80	5.0-30	---	5.1-8.4	0-2	0	0.0-2.0	0-10

Soil Survey of Robertson County, Texas

Table 15.—Chemical Properties of the Soils—Continued

Map symbol and soil name	Depth	Cation exchange- capacity	Effective cation- exchange capacity	Soil reaction	Calcium carbon- ate	Gypsum	Salinity	Sodium adsorp- tion ratio
	In	meq/100 g	meq/100 g	pH	Pct	Pct	mmhos/cm	
EdD2:								
Edge-----	0-4	2.0-10	---	4.5-7.3	0	0	0.0-2.0	0-2
	4-24	10-30	---	4.5-6.5	0	0	0.0-2.0	0-4
	24-43	10-30	---	4.5-6.5	0-2	0	0.0-2.0	0-4
	43-64	5.0-30	---	4.5-7.8	0-2	0	0.0-2.0	0-8
	64-80	5.0-30	---	5.1-8.4	0-2	0	0.0-2.0	0-10
EgD:								
Edge-----	0-5	2.0-10	---	4.5-7.3	0	0	0.0-2.0	0-2
	5-45	10-30	---	4.5-6.5	0	0	0.0-2.0	0-4
	45-54	10-30	---	4.5-6.5	0-2	0	0.0-2.0	0-4
	54-80	5.0-30	---	5.1-8.4	0-2	0	0.0-2.0	0-10
Gullied land.								
EuC:								
Eufaula-----	0-31	2.0-7.0	---	5.1-7.3	0	0	0	0
	31-80	2.0-7.0	---	5.1-7.3	0	0	0	0
Ga:								
Gaddy-----	0-9	3.0-8.0	---	7.4-8.4	0-5	0	0.0-2.0	0
	9-80	3.0-10	---	7.9-8.4	2-15	0	0.0-2.0	0
GsB:								
Gasil-----	0-15	2.0-5.0	---	6.1-7.8	0	0	0.0-2.0	0
	15-80	7.0-20	---	5.1-6.5	0	0	0.0-2.0	0
GsD:								
Gasil-----	0-11	2.0-5.0	---	6.1-7.8	0	0	0.0-2.0	0
	11-80	7.0-20	---	5.1-6.5	0	0	0.0-2.0	0
HaB:								
Hammond-----	0-8	10-15	---	6.1-7.8	0	0	0.0-2.0	0-2
	8-80	10-25	---	6.6-7.8	---	---	0.0-2.0	0-6
HaE:								
Hammond-----	0-6	10-15	---	6.1-7.8	0	0	0.0-2.0	0-2
	6-80	10-25	---	6.6-7.8	---	---	0.0-2.0	0-6
HeD:								
Hearne-----	0-10	2.0-10	---	4.5-6.5	0	0	0.0-2.0	0
	10-25	---	20-30	3.5-5.5	0	0	0.0-2.0	0
	25-80	---	10-25	3.5-5.5	0	0	0.0-2.0	0
HeE:								
Hearne-----	0-5	2.0-10	---	4.5-6.5	0	0	0.0-2.0	0
	5-29	---	20-30	3.5-5.5	0	0	0.0-2.0	0
	29-80	---	10-25	3.5-5.5	0	0	0.0-2.0	0
HnD:								
Hearne-----	0-1	2.0-10	---	4.5-6.5	0	0	0.0-2.0	0
	1-24	---	20-30	3.5-5.5	0	0	0.0-2.0	0
	24-80	---	10-25	3.5-5.5	0	0	0.0-2.0	0
HnE:								
Hearne-----	0-13	1.0-5.0	---	4.5-6.5	0	0	0.0-2.0	0
	13-36	---	20-30	3.5-5.5	0	0	0.0-2.0	0
	36-80	---	10-25	3.5-5.5	0	0	0.0-2.0	0

Soil Survey of Robertson County, Texas

Table 15.—Chemical Properties of the Soils—Continued

Map symbol and soil name	Depth	Cation exchange- capacity	Effective cation- exchange capacity	Soil reaction	Calcium carbon- ate	Gypsum	Salinity	Sodium adsorp- tion ratio
	In	meq/100 g	meq/100 g	pH	Pct	Pct	mmhos/cm	
HrD:								
Hearne-----	0-9	2.0-10	---	4.5-6.5	0	0	0.0-2.0	0
	9-28	---	20-30	3.5-5.5	0	0	0.0-2.0	0
	28-80	---	10-25	3.5-5.5	0	0	0.0-2.0	0
HsA:								
Highbank-----	0-17	10-20	---	7.4-8.4	5-10	0	0.0-2.0	0
	17-44	20-30	---	7.4-8.4	10-15	0	0.0-2.0	0
	44-80	15-30	---	7.4-8.4	10-15	0	0.0-2.0	0
LeC:								
Lexton-----	0-6	15-25	---	5.6-7.3	0	0	0.0-2.0	0
	6-55	20-30	---	5.1-6.5	0-5	0	0.0-2.0	0
	55-80	---	---	---	---	---	---	---
LeE:								
Lexton-----	0-5	15-25	---	5.6-7.3	0	0	0.0-2.0	0
	5-52	20-30	---	5.1-6.5	0-5	0	0.0-2.0	0
	52-80	---	---	---	---	---	---	---
LfA:								
Lufkin-----	0-9	4.0-10	---	5.1-6.5	0	0	0.0-2.0	0
	9-80	20-30	---	4.5-7.8	0	0	0.0-4.0	0-10
LuB:								
Luling-----	0-13	40-60	---	6.6-8.4	0	0	0.0-2.0	0-2
	13-52	40-60	---	6.6-8.4	1-5	0	0.0-2.0	0-2
	52-64	40-60	---	6.6-8.4	2-10	2-25	0.0-2.0	0-2
	64-80	35-60	---	6.6-8.4	1-10	2-25	0.0-4.0	2-4
LuC:								
Luling-----	0-8	40-60	---	6.6-8.4	0	0	0.0-2.0	0-2
	8-40	40-60	---	6.6-8.4	1-5	0	0.0-2.0	0-2
	40-62	40-60	---	6.6-8.4	2-10	2-25	0.0-2.0	0-2
	62-80	35-60	---	6.6-8.4	1-10	2-25	0.0-4.0	2-4
MgB:								
Margie-----	0-6	3.0-10	---	5.6-7.3	0	0	0.0-2.0	0
	6-28	5.0-20	---	5.1-7.3	0	0	0.0-2.0	0
	28-66	15-25	---	5.1-7.3	0	0	0.0-2.0	0
	66-72	5.0-25	---	5.1-7.8	0	0	0.0-2.0	0
	72-80	---	---	---	---	---	---	---
Na:								
Navasota-----	0-7	35-60	---	5.6-7.3	0	0	0.0-2.0	0
	7-69	30-45	---	4.5-6.5	0	0-5	0.0-2.0	0
	69-80	20-40	---	4.5-7.8	0-2	0-5	0.0-2.0	0
Nd:								
Navasota-----	0-11	35-60	---	5.6-6.5	0	0	0.0-2.0	0
	11-61	30-45	---	4.5-6.5	0	0-5	0.0-2.0	0
	61-80	20-40	---	4.5-6.5	0-2	0-5	0.0-2.0	0
Ot:								
Oletha-----	0-6	20-35	---	5.1-7.3	0	0	0.0-2.0	0-4
	6-39	10-25	---	5.1-7.3	0	0	2.0-8.0	5-15
	39-50	10-25	---	5.1-8.4	0-2	2-10	4.0-16.0	5-15
	50-72	10-25	---	5.1-8.4	0-2	0	4.0-16.0	0-8
	72-80	10-20	---	6.1-8.4	0-2	0	0.0-4.0	0-8

Soil Survey of Robertson County, Texas

Table 15.—Chemical Properties of the Soils—Continued

Map symbol and soil name	Depth	Cation exchange- capacity	Effective cation- exchange capacity	Soil reaction	Calcium carbon- ate	Gypsum	Salinity	Sodium adsorp- tion ratio
	In	meq/100 g	meq/100 g	pH	Pct	Pct	mmhos/cm	
PaC:								
Padina-----	0-5	2.0-5.0	---	5.6-7.3	0	0	0.0-2.0	0
	5-56	5.0-15	---	5.6-7.3	0	0	0.0-2.0	0
	56-80	10-20	---	5.1-6.5	0	0	0.0-2.0	0
PaE:								
Padina-----	0-5	2.0-5.0	---	5.6-7.3	0	0	0.0-2.0	0
	5-53	5.0-15	---	5.6-7.3	0	0	0.0-2.0	0
	53-80	10-20	---	5.1-6.5	0	0	0.0-2.0	0
Pt. Pits and Dumps								
RaA:								
Rader-----	0-14	2.0-5.0	---	4.5-6.5	0	0	0.0-2.0	0-2
	14-21	2.0-5.0	---	4.5-6.5	0	0	0.0-2.0	0-2
	21-24	---	10-20	4.5-6.0	0	0	0.0-2.0	2-5
	24-49	15-25	---	4.5-6.5	0	0	0.0-2.0	2-10
	49-80	10-25	---	5.1-8.4	0-5	0-2	0.0-4.0	2-10
RoB:								
Robco-----	0-16	1.0-5.0	---	5.1-6.5	0	0	0.0-2.0	0
	16-29	1.0-5.0	---	5.1-6.5	0	0	0.0-2.0	0
	29-34	---	5.0-10	4.5-6.0	0	0	0.0-2.0	0
	34-40	---	10-25	4.5-6.0	0	0	0.0-2.0	0
	40-80	10-30	---	4.5-7.3	0-1	0-1	0.0-2.0	0
Rr:								
Roetex-----	0-17	35-50	---	7.4-8.4	2-5	0	0.0-2.0	0
	17-55	35-50	---	7.4-8.4	2-10	0	0.0-2.0	0
	55-80	20-30	---	7.4-8.4	2-10	0	0.0-2.0	0
RsC:								
Rosanky-----	0-7	5.0-15	---	5.1-6.5	0	0	0.0-2.0	0
	7-39	15-30	---	5.1-6.0	0	0	0.0-2.0	0
	39-80	5.0-15	---	5.1-6.0	0	0	0.0-2.0	0
RsD:								
Rosanky-----	0-6	5.0-15	---	5.1-6.5	0	0	0.0-2.0	0
	6-36	15-30	---	5.1-6.0	0	0	0.0-2.0	0
	36-80	5.0-15	---	5.1-6.0	0	0	0.0-2.0	0
RvC2:								
Rosanky-----	0-4	5.0-15	---	5.1-6.5	0	0	0.0-2.0	0
	4-35	15-30	---	5.1-6.0	0	0	0.0-2.0	0
	35-80	5.0-15	---	5.1-6.0	0	0	0.0-2.0	0
Sa:								
Sandow-----	0-9	10-20	---	5.6-7.3	0	0	0.0-2.0	0
	9-80	5.0-25	---	5.6-7.8	0	0-4	0.0-4.0	0-8
ShA:								
Ships-----	0-6	25-40	---	7.9-8.4	10-20	0	0.0-2.0	1-2
	6-70	25-40	---	7.9-8.4	10-20	0	0.0-2.0	2-7
	70-80	25-40	---	7.9-8.4	1-15	0	0.0-2.0	2-9
ShB:								
Ships-----	0-15	25-40	---	7.9-8.4	10-20	0	0.0-2.0	1-2
	15-65	25-40	---	7.9-8.4	10-20	0	0.0-2.0	2-7
	65-80	25-40	---	7.9-8.4	1-15	0	0.0-2.0	2-9

Soil Survey of Robertson County, Texas

Table 15.—Chemical Properties of the Soils—Continued

Map symbol and soil name	Depth	Cation exchange- capacity	Effective cation- exchange capacity	Soil reaction	Calcium carbon- ate	Gypsum	Salinity	Sodium adsorp- tion ratio
	In	meq/100 g	meq/100 g	pH	Pct	Pct	mmhos/cm	
Sk:								
Ships-----	0-10	25-40	---	7.9-8.4	10-20	0	0.0-2.0	1-2
	10-65	25-40	---	7.9-8.4	10-20	0	0.0-2.0	2-7
	65-80	25-40	---	7.9-8.4	1-15	0	0.0-2.0	2-9
SmC:								
Silawa-----	0-15	1.0-5.0	---	5.1-6.5	0	0	0.0-2.0	0
	15-41	---	5.0-20	4.5-6.0	0	0	0.0-2.0	0
	41-57	---	5.0-15	4.5-6.0	0	0	0.0-2.0	0
	57-80	5.0-10	---	4.5-6.5	0	0	0.0-2.0	0
SmD:								
Silawa-----	0-14	1.0-5.0	---	5.1-6.5	0	0	0.0-2.0	0
	14-43	---	5.0-20	4.5-6.0	0	0	0.0-2.0	0
	43-48	---	5.0-15	4.5-6.0	0	0	0.0-2.0	0
	48-80	5.0-10	---	4.5-6.5	0	0	0.0-2.0	0
SnB:								
Silstid-----	0-6	2.0-5.0	---	5.6-7.3	0	0	0.0-2.0	0
	6-29	2.0-5.0	---	5.6-7.3	0	0	0.0-2.0	0
	29-63	3.0-10	---	5.1-6.5	0	0	0.0-2.0	0
	63-80	3.0-10	---	5.1-6.5	0	0	0.0-2.0	0
SnD:								
Silstid-----	0-5	2.0-5.0	---	5.6-7.3	0	0	0.0-2.0	0
	5-27	2.0-5.0	---	5.6-7.3	0	0	0.0-2.0	0
	27-45	3.0-10	---	5.1-6.5	0	0	0.0-2.0	0
	45-80	3.0-10	---	5.1-6.5	0	0	0.0-2.0	0
SpB:								
Spiller-----	0-12	1.0-5.0	---	5.6-7.3	0	0	0.0-2.0	0
	12-53	20-35	---	5.1-6.5	0	0	0.0-2.0	0
	53-59	20-35	---	5.1-7.3	0	0-2	0.0-2.0	0
	59-80	10-35	---	5.1-8.4	0-10	0-4	0.0-2.0	0
TaA:								
Tabor-----	0-17	2.0-5.0	---	5.1-6.5	0	0	0.0-2.0	0
	17-58	15-25	---	4.5-7.3	0	0	0.0-2.0	2-6
	58-80	10-20	---	5.1-8.4	0-2	0-2	0.0-2.0	5-10
Uh:								
Uhland-----	0-3	10-20	---	5.6-7.8	0	0	0.0-2.0	0-2
	3-48	5.0-20	---	5.6-7.8	0	0	0.0-2.0	0-4
	48-80	15-30	---	5.6-7.8	0	0-4	0.0-4.0	0-4
W.								
Water								
WeA:								
Weswood-----	0-4	10-25	---	7.4-8.4	5-15	0	0.0-2.0	0-1
	4-64	10-25	---	7.4-8.4	5-15	0	0.0-2.0	0-1
	64-80	15-35	---	7.4-8.4	5-15	0	0.0-2.0	0-7
WwA:								
Weswood-----	0-7	10-25	---	7.4-8.4	5-15	0	0.0-2.0	0-1
	7-55	10-25	---	7.4-8.4	5-15	0	0.0-2.0	0-1
	55-80	15-35	---	7.4-8.4	5-15	0	0.0-2.0	0-7

Soil Survey of Robertson County, Texas

Table 15.—Chemical Properties of the Soils—Continued

Map symbol and soil name	Depth	Cation exchange- capacity	Effective cation- exchange capacity	Soil reaction	Calcium carbon- ate	Gypsum	Salinity	Sodium adsorp- tion ratio
	In	meq/100 g	meq/100 g	pH	Pct	Pct	mmhos/cm	
WwB:								
Weswood-----	0-9	10-25	---	7.4-8.4	5-15	0	0.0-2.0	0-1
	9-80	10-25	---	7.4-8.4	5-15	0	0.0-2.0	0-1
Wx:								
Weswood-----	0-10	10-25	---	7.4-8.4	5-15	0	0.0-2.0	0-1
	10-38	10-25	---	7.4-8.4	5-15	0	0.0-2.0	0-1
	38-80	15-35	---	7.4-8.4	5-15	0	0.0-2.0	0-7
Yahola-----	0-10	4.0-8.0	---	7.4-8.4	5-10	0	0	0
	10-35	3.0-7.0	---	7.9-8.4	5-10	0	0	0
	35-80	3.0-7.0	---	7.9-8.4	5-10	0	0	0
Wy:								
Whitesboro-----	0-22	10-25	---	5.6-7.8	0	0	0.0-2.0	0
	22-29	10-25	---	5.6-8.4	0	0	0.0-2.0	0
	29-80	10-25	---	6.1-8.4	0	0	0.0-2.0	0
WzA:								
Wilson-----	0-7	10-20	---	5.6-7.3	0	0	0.0-2.0	0-2
	7-67	20-30	---	5.6-7.8	1-10	0-4	0.0-4.0	2-10
	67-80	20-30	---	6.6-8.4	1-20	2-15	2.0-8.0	4-13
YaA:								
Yahola-----	0-13	3.0-7.0	---	7.4-8.4	5-10	0	0	0
	13-44	3.0-7.0	---	7.9-8.4	5-10	0	0	0
	44-80	3.0-7.0	---	7.9-8.4	5-10	0	0	0
Zb:								
Zilaboy-----	0-9	40-60	---	5.6-7.3	0	0	0.0-2.0	0
	9-80	40-55	---	5.6-8.4	0-10	0	0.0-2.0	0

Soil Survey of Robertson County, Texas

Table 16.—Soil Features

(See text for definitions of terms used in this table. Absence of an entry indicates that the feature is not a concern or that data were not estimated)

Map symbol and soil name	Risk of corrosion	
	Uncoated steel	Concrete
AaD: Arenosa-----	Low	Low
BaB: Bastrop-----	Moderate	Low
BeB: Benchley-----	High	Moderate
BeC: Benchley-----	High	Moderate
BrB: Bremond-----	High	Low
BsA: Bremond-----	High	Low
Wilson-----	High	High
BuA: Burleson-----	High	Moderate
CaA: Cadelake-----	High	High
ChC: Chazos-----	High	Moderate
CoA: Coarsewood-----	Low	Low
CoB: Coarsewood-----	Low	Low
CrB: Crockett-----	High	Low
CrC2: Crockett-----	High	Low
DAM. Dam		
DfC: Desan-----	Moderate	Moderate
DmB: Dimebox-----	High	High
DuB: Dutek-----	Moderate	Moderate
DuD: Dutek-----	Moderate	Moderate

Soil Survey of Robertson County, Texas

Table 16.—Soil Features—Continued

Map symbol and soil name	Risk of corrosion	
	Uncoated steel	Concrete
EdC: Edge-----	Moderate	Moderate
EdC2: Edge-----	Moderate	Moderate
EdD2: Edge-----	Moderate	Moderate
EgD: Edge-----	Moderate	Moderate
Gullied land.		
EuC: Eufaula-----	Low	Moderate
Ga: Gaddy-----	Low	Low
GsB: Gasil-----	Low	Moderate
GsD: Gasil-----	Low	Moderate
HaB: Hammond-----	Moderate	Low
HaE: Hammond-----	Moderate	Low
HeD: Hearne-----	High	High
HeE: Hearne-----	High	High
HnD: Hearne-----	High	High
HnE: Hearne-----	High	High
HrD: Hearne-----	High	High
HsA: Highbank-----	High	Low
LeC: Lexton-----	High	Moderate
LeE: Lexton-----	High	Moderate
LfA: Lufkin-----	High	Moderate
LuB: Luling-----	High	Low

Soil Survey of Robertson County, Texas

Table 16.—Soil Features—Continued

Map symbol and soil name	Risk of corrosion	
	Uncoated steel	Concrete
LuC: Luling-----	High	Low
MgB: Margie-----	High	Moderate
Na: Navasota-----	High	Moderate
Nd: Navasota-----	High	Moderate
Ot: Oletha-----	High	Moderate
PaC: Padina-----	High	Moderate
PaE: Padina-----	High	Moderate
Pt. Pits and Dumps		
RaA: Rader-----	High	Moderate
RoB: Robco-----	High	High
Rr: Roetex-----	Low	Low
RsC: Rosanky-----	High	Low
RsD: Rosanky-----	High	Low
RvC2: Rosanky-----	High	Low
Sa: Sandow-----	High	Low
ShA: Ships-----	High	Low
ShB: Ships-----	High	Low
Sk: Ships-----	High	Low
SmC: Silawa-----	Moderate	Moderate
SmD: Silawa-----	Moderate	Moderate
SnB: Silstid-----	Moderate	Moderate

Soil Survey of Robertson County, Texas

Table 16.—Soil Features—Continued

Map symbol and soil name	Risk of corrosion	
	Uncoated steel	Concrete
SnD: Silstid-----	Moderate	Moderate
SpB: Spiller-----	High	Moderate
TaA: Tabor-----	High	High
Uh: Uhland-----	High	Low
W. Water		
WeA: Weswood-----	High	Low
WwA: Weswood-----	High	Low
WwB: Weswood-----	High	Low
Wx: Weswood-----	High	Low
Yahola-----	Low	Low
Wy: Whitesboro-----	High	Low
WzA: Wilson-----	High	High
YaA: Yahola-----	Low	Low
Zb: Zilaboy-----	High	Low

Soil Survey of Robertson County, Texas

Table 17.—Water Features

(Depths of layers are in feet. See text for definitions of terms used in this table. Estimates of the frequency of ponding and flooding apply to the whole year rather than to individual months. Absence of an entry indicates that the feature is not a concern or that data were not estimated)

Map symbol and soil name	Hydro- logic group	Month	Water table		Ponding			Flooding	
			Upper limit	Lower limit	Surface water depth	Duration	Frequency	Duration	Frequency
			<u>Ft</u>	<u>Ft</u>	<u>Ft</u>				
AaD: Arenosa-----	A	Jan-Dec	---	---	---	---	None	---	None
BaB: Bastrop-----	B	Jan-Dec	---	---	---	---	None	---	None
BeB: Benchley-----	D	Jan-Dec	---	---	---	---	None	---	None
BeC: Benchley-----	D	Jan-Dec	---	---	---	---	None	---	None
BrB: Bremond-----	D	Jan-Dec	---	---	---	---	None	---	None
BsA: Bremond-----	D	Jan-Dec	---	---	---	---	None	---	None
Wilson-----	D	Jan-Dec	---	---	---	---	None	---	None
BuA: Burleson-----	D	Jan-Dec	---	---	---	---	None	---	None
CaA: Cadelake-----	D	January	0.0-1.5	>6.0	---	---	None	---	None
		February	0.0-1.5	>6.0	---	---	None	---	None
		March	0.0-1.5	>6.0	---	---	None	---	None
		April	0.0-1.5	>6.0	---	---	None	---	None
		May	0.0-1.5	>6.0	---	---	None	---	None
		June	0.0-1.5	>6.0	---	---	None	---	None
		July	0.0-1.5	>6.0	---	---	None	---	None
		August	0.0-1.5	>6.0	---	---	None	---	None
		September	0.0-1.5	>6.0	---	---	None	---	None
		October	0.0-1.5	>6.0	---	---	None	---	None
		November	0.0-1.5	>6.0	---	---	None	---	None
		December	0.0-1.5	>6.0	---	---	None	---	None
ChC: Chazos-----	C	Jan-Dec	---	---	---	---	None	---	None

Soil Survey of Robertson County, Texas

Table 17.—Water Features—Continued

Map symbol and soil name	Hydro- logic group	Month	Water table		Surface water depth	Ponding		Flooding	
			Upper limit	Lower limit		Duration	Frequency	Duration	Frequency
			<u>Ft</u>	<u>Ft</u>	<u>Ft</u>				
CoA: Coarsewood-----	B	January	---	---	---	---	None	Brief	Rare
		February	---	---	---	---	None	Brief	Rare
		March	---	---	---	---	None	Brief	Rare
		April	---	---	---	---	None	Brief	Rare
		May	---	---	---	---	None	Brief	Rare
		June	---	---	---	---	None	Brief	Rare
		July	---	---	---	---	None	Brief	Rare
		August	---	---	---	---	None	Brief	Rare
		September	---	---	---	---	None	Brief	Rare
		October	---	---	---	---	None	Brief	Rare
		November	---	---	---	---	None	Brief	Rare
		December	---	---	---	---	None	Brief	Rare
CoB: Coarsewood-----	B	January	---	---	---	---	None	Brief	Rare
		February	---	---	---	---	None	Brief	Rare
		March	---	---	---	---	None	Brief	Rare
		April	---	---	---	---	None	Brief	Rare
		May	---	---	---	---	None	Brief	Rare
		June	---	---	---	---	None	Brief	Rare
		July	---	---	---	---	None	Brief	Rare
		August	---	---	---	---	None	Brief	Rare
		September	---	---	---	---	None	Brief	Rare
		October	---	---	---	---	None	Brief	Rare
		November	---	---	---	---	None	Brief	Rare
		December	---	---	---	---	None	Brief	Rare
CrB: Crockett-----	D	Jan-Dec	---	---	---	---	None	---	None
CrC2: Crockett-----	D	Jan-Dec	---	---	---	---	None	---	None
DAM. Dam									
DfC: Desan-----	A	Jan-Dec	---	---	---	---	None	---	None
DmB: Dimebox-----	D	Jan-Dec	---	---	---	---	None	---	None
DuB: Dutek-----	A	Jan-Dec	---	---	---	---	None	---	None
DuD: Dutek-----	A	Jan-Dec	---	---	---	---	None	---	None

Soil Survey of Robertson County, Texas

Table 17.—Water Features—Continued

Map symbol and soil name	Hydro- logic group	Month	Water table		Surface water depth	Ponding		Flooding	
			Upper limit	Lower limit		Duration	Frequency	Duration	Frequency
			<u>Ft</u>	<u>Ft</u>	<u>Ft</u>				
EdC: Edge-----	D	Jan-Dec	---	---	---	---	None	---	None
EdC2: Edge-----	D	Jan-Dec	---	---	---	---	None	---	None
EdD2: Edge-----	D	Jan-Dec	---	---	---	---	None	---	None
EgD: Edge-----	D	Jan-Dec	---	---	---	---	None	---	None
Gullied land.									
EuC: Eufaula-----	A	Jan-Dec	---	---	---	---	None	---	None
Ga: Gaddy-----	A	January	---	---	---	---	None	Brief	Frequent
		February	---	---	---	---	None	Brief	Frequent
		March	---	---	---	---	None	Brief	Frequent
		April	---	---	---	---	None	Brief	Frequent
		May	---	---	---	---	None	Brief	Frequent
		Jun-Nov	---	---	---	---	None	---	None
		December	---	---	---	---	None	Brief	Frequent
GsB: Gasil-----	B	Jan-Dec	---	---	---	---	None	---	None
GsD: Gasil-----	B	Jan-Dec	---	---	---	---	None	---	None
HaB: Hammond-----	C	Jan-Dec	---	---	---	---	None	---	None
HaE: Hammond-----	C	Jan-Dec	---	---	---	---	None	---	None
HeD: Hearne-----	C	Jan-Dec	---	---	---	---	None	---	None
HeE: Hearne-----	C	Jan-Dec	---	---	---	---	None	---	None

Soil Survey of Robertson County, Texas

Table 17.—Water Features—Continued

Map symbol and soil name	Hydro- logic group	Month	Water table		Surface water depth	Ponding		Flooding	
			Upper limit	Lower limit		Duration	Frequency	Duration	Frequency
			<u>Ft</u>	<u>Ft</u>	<u>Ft</u>				
HnD: Hearne-----	D	Jan-Dec	---	---	---	---	None	---	None
HnE: Hearne-----	C	Jan-Dec	---	---	---	---	None	---	None
HrD: Hearne-----	C	Jan-Dec	---	---	---	---	None	---	None
HsA: Highbank-----	C	January	---	---	---	---	None	Brief	Rare
		February	---	---	---	---	None	Brief	Rare
		March	---	---	---	---	None	Brief	Rare
		April	---	---	---	---	None	Brief	Rare
		May	---	---	---	---	None	Brief	Rare
		June	---	---	---	---	None	Brief	Rare
		July	---	---	---	---	None	Brief	Rare
		August	---	---	---	---	None	Brief	Rare
		September	---	---	---	---	None	Brief	Rare
		October	---	---	---	---	None	Brief	Rare
		November	---	---	---	---	None	Brief	Rare
		December	---	---	---	---	None	Brief	Rare
LeC: Lexton-----	B	Jan-Dec	---	---	---	---	None	---	None
LeE: Lexton-----	B	Jan-Dec	---	---	---	---	None	---	None
LfA: Lufkin-----	D	Jan-Dec	---	---	---	---	None	---	None
LuB: Luling-----	D	Jan-Dec	---	---	---	---	None	---	None
LuC: Luling-----	D	Jan-Dec	---	---	---	---	None	---	None
MgB: Margie-----	C	Jan-Dec	---	---	---	---	None	---	None

Soil Survey of Robertson County, Texas

Table 17.—Water Features—Continued

Map symbol and soil name	Hydro- logic group	Month	Water table		Surface water depth	Ponding		Flooding	
			Upper limit	Lower limit		Duration	Frequency	Duration	Frequency
			<u>Ft</u>	<u>Ft</u>	<u>Ft</u>				
Na: Navasota-----	D	January	1.0-2.5	1.5-3.5	---	---	None	Very long	Frequent
		February	1.0-2.5	1.5-3.5	---	---	None	Very long	Frequent
		March	1.0-2.5	1.5-3.5	---	---	None	Very long	Frequent
		April	1.0-2.5	1.5-3.5	---	---	None	Very long	Frequent
		May	1.0-2.5	1.5-3.5	---	---	None	Very long	Frequent
		Jun-Sep	---	---	---	---	None	---	None
		October	1.0-2.5	1.5-3.5	---	---	None	Very long	Frequent
		November	1.0-2.5	1.5-3.5	---	---	None	Very long	Frequent
		December	1.0-2.5	1.5-3.5	---	---	None	Very long	Frequent
Nd: Navasota-----	D	January	0.0	>6.0	0.0-1.0	Very long	Occasional	Very long	Frequent
		February	0.0	>6.0	0.0-1.0	Very long	Occasional	Very long	Frequent
		March	0.0	>6.0	0.0-1.0	Very long	Occasional	Very long	Frequent
		April	0.0	>6.0	0.0-1.0	Very long	Occasional	Very long	Frequent
		May	0.0	>6.0	0.0-1.0	Very long	Occasional	Very long	Frequent
		Jun-Sep	---	---	---	---	None	---	None
		October	0.0	>6.0	0.0-1.0	Very long	Occasional	Very long	Frequent
		November	0.0	>6.0	0.0-1.0	Very long	Occasional	Very long	Frequent
		December	0.0	>6.0	0.0-1.0	Very long	Occasional	Very long	Frequent
Ot: Oletha-----	D	January	2.5-4.0	>6.0	---	---	None	Brief	Frequent
		February	2.5-4.0	>6.0	---	---	None	Brief	Frequent
		March	2.5-4.0	>6.0	---	---	None	Brief	Frequent
		April	2.5-4.0	>6.0	---	---	None	Brief	Frequent
		May	2.5-4.0	>6.0	---	---	None	Brief	Frequent
		Jun-Oct	---	---	---	---	None	---	None
		November	2.5-4.0	>6.0	---	---	None	Brief	Frequent
		December	2.5-4.0	>6.0	---	---	None	Brief	Frequent
PaC: Padina-----	B	Jan-Dec	---	---	---	---	None	---	None
PaE: Padina-----	B	Jan-Dec	---	---	---	---	None	---	None
Pt. Pits and Dumps									
RaA: Rader-----	D	January	2.0-4.0	2.5-5.0	---	---	None	---	None
		February	2.0-4.0	2.5-5.0	---	---	None	---	None
		March	2.0-4.0	2.5-5.0	---	---	None	---	None
		April	2.0-4.0	2.5-5.0	---	---	None	---	None
		May	2.0-4.0	2.5-5.0	---	---	None	---	None
		Jun-Nov	---	---	---	---	None	---	None
		December	2.0-4.0	2.5-5.0	---	---	None	---	None

Soil Survey of Robertson County, Texas

Table 17.—Water Features—Continued

Map symbol and soil name	Hydro- logic group	Month	Water table		Surface water depth	Ponding		Flooding	
			Upper limit	Lower limit		Duration	Frequency	Duration	Frequency
			<u>Ft</u>	<u>Ft</u>	<u>Ft</u>				
RoB: Robco-----	C	January	1.5-3.5	2.0-4.0	---	---	None	---	None
		February	1.5-3.5	2.0-4.0	---	---	None	---	None
		March	1.5-3.5	2.0-4.0	---	---	None	---	None
		April	1.5-3.5	2.0-4.0	---	---	None	---	None
		May-Dec	---	---	---	---	None	---	None
Rr: Roetex-----	D	January	0.0	>6.0	0.0-0.5	Long	Occasional	Very long	Frequent
		February	0.0	>6.0	0.0-0.5	Long	Occasional	Very long	Frequent
		March	0.0	>6.0	0.0-0.5	Long	Occasional	Very long	Frequent
		April	0.0	>6.0	0.0-0.5	Long	Occasional	Very long	Frequent
		May	0.0	>6.0	0.0-0.5	Long	Occasional	Very long	Frequent
		Jun-Sep	---	---	---	---	None	---	None
		October	0.0	>6.0	0.0-0.5	Long	Occasional	Very long	Frequent
		November	0.0	>6.0	0.0-0.5	Long	Occasional	Very long	Frequent
		December	0.0	>6.0	0.0-0.5	Long	Occasional	Very long	Frequent
RsC: Rosanky-----	C	Jan-Dec	---	---	---	---	None	---	None
RsD: Rosanky-----	C	Jan-Dec	---	---	---	---	None	---	None
RvC2: Rosanky-----	C	Jan-Dec	---	---	---	---	None	---	None
Sa: Sandow-----	C	January	3.5-6.0	4.0-6.0	---	---	None	Brief	Frequent
		February	3.5-6.0	4.0-6.0	---	---	None	Brief	Frequent
		March	3.5-6.0	4.0-6.0	---	---	None	Brief	Frequent
		April	3.5-6.0	4.0-6.0	---	---	None	Brief	Frequent
		May	---	---	---	---	None	Brief	Frequent
		Jun-Nov	---	---	---	---	None	---	None
		December	3.5-6.0	4.0-6.0	---	---	None	Brief	Frequent
ShA: Ships-----	D	January	---	---	---	---	None	Brief	Rare
		February	---	---	---	---	None	Brief	Rare
		March	---	---	---	---	None	Brief	Rare
		April	---	---	---	---	None	Brief	Rare
		May	---	---	---	---	None	Brief	Rare
		June	---	---	---	---	None	Brief	Rare
		July	---	---	---	---	None	Brief	Rare
		August	---	---	---	---	None	Brief	Rare
		September	---	---	---	---	None	Brief	Rare
		October	---	---	---	---	None	Brief	Rare
		November	---	---	---	---	None	Brief	Rare
		December	---	---	---	---	None	Brief	Rare

Soil Survey of Robertson County, Texas

Table 17.—Water Features—Continued

Map symbol and soil name	Hydro- logic group	Month	Water table		Surface water depth	Ponding		Flooding	
			Upper limit	Lower limit		Duration	Frequency	Duration	Frequency
			<u>Ft</u>	<u>Ft</u>	<u>Ft</u>				
ShB: Ships-----	D	January	---	---	---	---	None	Brief	Rare
		February	---	---	---	---	None	Brief	Rare
		March	---	---	---	---	None	Brief	Rare
		April	---	---	---	---	None	Brief	Rare
		May	---	---	---	---	None	Brief	Rare
		June	---	---	---	---	None	Brief	Rare
		July	---	---	---	---	None	Brief	Rare
		August	---	---	---	---	None	Brief	Rare
		September	---	---	---	---	None	Brief	Rare
		October	---	---	---	---	None	Brief	Rare
		November	---	---	---	---	None	Brief	Rare
		December	---	---	---	---	None	Brief	Rare
Sk: Ships-----	D	Jan-Apr	---	---	---	---	None	---	None
		May	---	---	---	---	None	Brief	Frequent
		June	---	---	---	---	None	Brief	Frequent
		July	---	---	---	---	None	Brief	Frequent
		August	---	---	---	---	None	Brief	Frequent
		September	---	---	---	---	None	Brief	Frequent
		October	---	---	---	---	None	Brief	Frequent
		Nov-Dec	---	---	---	---	None	---	None
SmC: Silawa-----	B	Jan-Dec	---	---	---	---	None	---	None
SmD: Silawa-----	B	Jan-Dec	---	---	---	---	None	---	None
SnB: Silstid-----	B	Jan-Dec	---	---	---	---	None	---	None
SnD: Silstid-----	B	Jan-Dec	---	---	---	---	None	---	None
SpB: Spiller-----	C	Jan-Dec	---	---	---	---	None	---	None
TaA: Tabor-----	D	Jan-Dec	---	---	---	---	None	---	None
Uh: Uhland-----	B	January	---	---	---	---	None	---	None
		February	---	---	---	---	None	Brief	Frequent
		March	2.0-3.5	2.5-5.0	---	---	None	Brief	Frequent
		April	2.0-3.5	2.5-5.0	---	---	None	Brief	Frequent
		May	2.0-3.5	2.5-5.0	---	---	None	Brief	Frequent
		June	---	---	---	---	None	Brief	Frequent
		Jul-Dec	---	---	---	---	None	---	None

Soil Survey of Robertson County, Texas

Table 17.—Water Features—Continued

Map symbol and soil name	Hydro- logic group	Month	Water table		Surface water depth	Ponding		Flooding	
			Upper limit	Lower limit		Duration	Frequency	Duration	Frequency
			<u>Ft</u>	<u>Ft</u>	<u>Ft</u>				
W. Water									
WeA: Weswood-----	B	January	---	---	---	---	None	Brief	Rare
		February	---	---	---	---	None	Brief	Rare
		March	---	---	---	---	None	Brief	Rare
		April	---	---	---	---	None	Brief	Rare
		May	---	---	---	---	None	Brief	Rare
		June	---	---	---	---	None	Brief	Rare
		July	---	---	---	---	None	Brief	Rare
		August	---	---	---	---	None	Brief	Rare
		September	---	---	---	---	None	Brief	Rare
		October	---	---	---	---	None	Brief	Rare
		November	---	---	---	---	None	Brief	Rare
		December	---	---	---	---	None	Brief	Rare
WwA: Weswood-----	B	January	---	---	---	---	None	Brief	Rare
		February	---	---	---	---	None	Brief	Rare
		March	---	---	---	---	None	Brief	Rare
		April	---	---	---	---	None	Brief	Rare
		May	---	---	---	---	None	Brief	Rare
		June	---	---	---	---	None	Brief	Rare
		July	---	---	---	---	None	Brief	Rare
		August	---	---	---	---	None	Brief	Rare
		September	---	---	---	---	None	Brief	Rare
		October	---	---	---	---	None	Brief	Rare
		November	---	---	---	---	None	Brief	Rare
		December	---	---	---	---	None	Brief	Rare
WwB: Weswood-----	B	January	---	---	---	---	None	Brief	Rare
		February	---	---	---	---	None	Brief	Rare
		March	---	---	---	---	None	Brief	Rare
		April	---	---	---	---	None	Brief	Rare
		May	---	---	---	---	None	Brief	Rare
		June	---	---	---	---	None	Brief	Rare
		July	---	---	---	---	None	Brief	Rare
		August	---	---	---	---	None	Brief	Rare
		September	---	---	---	---	None	Brief	Rare
		October	---	---	---	---	None	Brief	Rare
		November	---	---	---	---	None	Brief	Rare
		December	---	---	---	---	None	Brief	Rare
Wx: Weswood-----	B	Jan-Feb	---	---	---	---	None	---	None
		March	---	---	---	---	None	Brief	Frequent
		April	---	---	---	---	None	Brief	Frequent
		May	---	---	---	---	None	Brief	Frequent
		June	---	---	---	---	None	Brief	Frequent
		July	---	---	---	---	None	Brief	Frequent
		August	---	---	---	---	None	Brief	Frequent
		September	---	---	---	---	None	Brief	Frequent
		Oct-Dec	---	---	---	---	None	---	None

Soil Survey of Robertson County, Texas

Table 17.—Water Features—Continued

Map symbol and soil name	Hydro- logic group	Month	Water table		Surface water depth	Ponding		Flooding	
			Upper limit	Lower limit		Duration	Frequency	Duration	Frequency
			<u>Ft</u>	<u>Ft</u>	<u>Ft</u>				
Wx: Yahola-----	B	Jan-Mar	---	---	---	---	None	---	None
		April	---	---	---	---	None	Very brief	Frequent
		May	---	---	---	---	None	Very brief	Frequent
		June	---	---	---	---	None	Very brief	Frequent
		July	---	---	---	---	None	Very brief	Frequent
		August	---	---	---	---	None	Very brief	Frequent
		September	---	---	---	---	None	Very brief	Frequent
		October	---	---	---	---	None	Very brief	Frequent
		Nov-Dec	---	---	---	---	None	---	None
Wy: Whitesboro-----	C	January	---	---	---	---	None	Brief	Frequent
		February	---	---	---	---	None	Brief	Frequent
		March	---	---	---	---	None	Brief	Frequent
		April	---	---	---	---	None	Brief	Frequent
		May	---	---	---	---	None	Brief	Frequent
		Jun-Aug	---	---	---	---	None	---	None
		September	---	---	---	---	None	Brief	Frequent
		October	---	---	---	---	None	Brief	Frequent
		November	---	---	---	---	None	Brief	Frequent
		December	---	---	---	---	None	Brief	Frequent
WzA: Wilson-----	D	Jan-Dec	---	---	---	---	None	---	None
YaA: Yahola-----	B	January	---	---	---	---	None	Brief	Rare
		February	---	---	---	---	None	Brief	Rare
		March	---	---	---	---	None	Brief	Rare
		April	---	---	---	---	None	Brief	Rare
		May	---	---	---	---	None	Brief	Rare
		June	---	---	---	---	None	Brief	Rare
		July	---	---	---	---	None	Brief	Rare
		August	---	---	---	---	None	Brief	Rare
		September	---	---	---	---	None	Brief	Rare
		October	---	---	---	---	None	Brief	Rare
		November	---	---	---	---	None	Brief	Rare
		December	---	---	---	---	None	Brief	Rare
Zb: Zilaboy-----	D	January	1.0-3.0	>6.0	---	---	None	Brief	Frequent
		February	1.0-3.0	>6.0	---	---	None	Brief	Frequent
		March	1.0-3.0	>6.0	---	---	None	Brief	Frequent
		April	1.0-3.0	>6.0	---	---	None	Brief	Frequent
		May	1.0-3.0	>6.0	---	---	None	Brief	Frequent
		Jun-Jul	---	---	---	---	None	---	None
		September	---	---	---	---	None	Brief	Frequent
		October	1.0-3.0	>6.0	---	---	None	Brief	Frequent
		November	1.0-3.0	>6.0	---	---	None	Brief	Frequent
		December	1.0-3.0	>6.0	---	---	None	Brief	Frequent

Table 18.—Physical Analyses of Selected Soils

(Analyses were made by the Soil Characterization Laboratory, Texas Agricultural Experiment Station, College Station, Texas, and by the National Soil Survey Laboratory, Natural Resources Conservation Service, Lincoln, Nebraska.
TR means trace)

Soil name, footnotes, and sample number	Depth	Horizon	Particle-size distribution (percent less than 2 mm)										Water content	
			Sand					Silt (0.05- (0.002 mm)	Clay <0.002	Bulk density 1/3 bar	1/3 bar	15 bar		
			Very coarse (2-1 mm)	Coarse (1-0.5 mm)	Medium (0.5- (.25 mm)	Fine (0.25- 0.1 mm)	Very fine (0.1- 0.05 mm)						Total (2- 0.05 mm)	
														Pct
Crockett: 1,2,3 (S86TX-395-001)	In		Pct	Pct	Pct	Pct	Pct	Pct	Pct	Pct	g/cc	Pct	Pct	
	0-4	Ap	1.1	1.0	4.1	25.0	23.1	51.3	23.2	22.5	1.47	26.3	---	
	4-7	A	0.9	1.1	4.9	30.9	27.4	65.2	17.1	17.7	1.61	19.6	---	
	7-15	Bt1	0.6	0.6	2.8	14.2	14.1	32.3	21.0	46.7	1.40	30.6	---	
	15-22	Bt2	0.8	0.7	2.7	14.6	15.2	34.0	22.9	43.1	1.58	24.5	---	
	22-30	Bt3	0.8	0.7	2.9	15.1	15.5	35.0	24.3	40.7	---	---	---	
	30-36	Bt4	0.6	0.6	2.6	14.9	16.3	35.0	23.2	41.8	---	---	---	
	36-48	Bt5	1.3	0.6	2.3	16.0	18.8	39.0	21.0	40.0	---	---	---	
	48-60	2Btb1	0.3	0.2	1.2	14.5	29.8	46.0	20.9	33.1	---	---	---	
	60-80	2Btb2	0.1	0.1	0.3	6.7	44.6	51.8	19.8	28.4	---	---	---	
Edge: 4,5,6 (S86TX-395-002)	0-5	Ap	0.9	2.6	12.8	47.7	17.7	81.7	13.1	5.2	---	---	---	
	5-15	Bt1	0.5	1.2	4.3	15.4	8.3	29.7	8.5	61.8	---	---	---	
	15-25	Bt2	0.6	1.3	5.0	20.8	12.9	40.6	18.3	41.1	---	---	---	
	25-41	Bt3	0.3	1.1	4.3	21.9	17.9	45.5	19.6	34.9	---	---	---	
	41-54	Bt4	0.2	0.7	2.6	17.4	18.7	39.6	23.3	37.1	---	---	---	
	54-66	BC	0.2	0.5	2.8	24.0	25.1	52.6	17.9	29.5	---	---	---	
	66-80	C	0.0	0.0	0.2	1.1	1.5	2.8	21.9	75.3	---	---	---	
	0-2	A	0.4	0.5	2.3	44.1	29.0	76.3	17.4	6.3	1.27	18.1	6.2	
	2-5	E	0.2	0.5	3.3	44.1	29.1	77.2	16.9	5.9	1.50	12.2	3.1	
	5-10	Bt1	0.1	0.3	1.2	17.3	20.3	39.2	14.9	45.9	1.37	27.1	18.4	
Edge: 4,7,8 (S91TX-395-003)	10-15	Bt2	0.1	0.2	1.4	22.9	22.8	47.4	19.8	32.8	1.42	25.9	13.7	
	15-20	Bt3	0.1	0.1	0.8	15.4	22.0	38.4	26.9	34.7	1.48	23.2	16.1	
	20-26	Bt3	0.3	0.2	0.4	16.1	26.2	43.2	27.1	29.7	1.42	26.4	15.6	
	26-32	Bt3k1	0.5	0.3	0.5	17.7	26.0	45.0	25.5	29.5	1.49	23.4	13.7	
	32-43	Bt3k2	0.3	0.2	0.5	19.1	22.9	43.0	26.8	30.2	1.44	25.6	14.7	
	43-52	BCK	0.1	0.1	0.7	36.1	24.4	61.4	17.4	21.2	1.57	26.5	13.2	
	52-67	Ck	0.2	0.3	0.5	6.0	33.4	40.4	31.3	28.3	1.39	27.9	14.0	
	67-80	C	0.1	0.2	0.1	25.5	25.2	51.1	25.4	23.5	1.41	14.8	10.1	

See footnotes at end of table

Table 18.—Physical Analyses of Selected Soils—Continued

Soil name, footnotes, and sample number	Depth	Horizon	Particle-size distribution (percent less than 2 mm)										Water content	
			Sand					Silt (0.05- (0.002 mm)	Clay <0.002	Bulk density 1/3 bar	1/3 bar		15 bar	
			Very coarse (2-1 mm)	Coarse (1-0.5 mm)	Medium (0.5- 0.25- mm)	Fine (0.25- 0.1 mm)	Very fine (0.1- 0.05 mm)							Total (2- 0.05 mm)
Rader: 7,9,10 (S91TX-395-002)	In		Pct	Pct	Pct	Pct	Pct	Pct	Pct	Pct	g/cc	Pct	Pct	
	0-4	Ap	---	0.3	4.7	40.4	29.5	74.9	21.2	3.9	1.60	11.9	2.2	
	4-9	A	0.2	0.5	4.6	39.6	25.0	69.9	25.4	4.7	1.33	6.8	1.8	
	9-14	E1	0.3	0.5	2.8	38.7	24.3	66.6	27.7	5.7	1.60	7.7	1.8	
	14-18	E2	1.1	0.7	4.0	36.2	21.6	63.6	28.2	8.2	1.59	8.3	3.5	
	18-22	Bt/E	0.7	0.5	3.7	27.1	20.4	52.4	22.2	25.4	1.48	23.0	9.9	
	22-31	Bt	0.3	0.3	2.4	20.1	14.6	37.7	19.1	43.2	1.57	22.5	16.3	
	31-41	Btz	TR	0.3	2.3	22.4	17.1	42.1	24.4	33.5	1.63	21.5	15.1	
	41-50	Btkz	0.1	0.3	2.5	25.3	17.3	45.5	23.9	30.6	1.62	21.5	13.7	
	50-60	Btz	0.1	0.2	2.3	21.4	18.9	42.9	25.5	31.6	1.62	21.4	14.3	
	60-71	BC1	TR	0.2	1.9	22.5	18.9	43.5	26.2	30.3	1.60	22.9	13.5	
	71-106	BC2	0.2	0.2	1.7	28.3	21.4	51.8	22.7	25.5	---	---	12.4	
106-121	BC3	0.2	0.3	1.2	38.4	21.8	61.9	12.6	25.5	---	---	12.9		
Silawa: 7,11,12 (S91TX-395-001)	0-5	Ap	0.2	0.5	7.5	59.5	17.2	84.9	12.6	2.5	1.45	8.5	2.6	
	5-8	A	0.1	0.5	8.7	55.1	20.1	84.5	12.2	3.3	1.58	6.4	1.8	
	8-11	E	0.4	0.7	7.6	52.1	19.0	79.8	15.4	4.8	1.65	8.2	2.0	
	11-19	Bt1	0.2	0.4	3.3	37.2	14.4	55.5	14.4	30.1	1.60	19.4	12.0	
	19-34	Bt2	0.4	0.6	5.0	32.8	11.3	50.1	15.8	34.1	1.60	20.2	14.6	
	34-38	2Bt3	2.7	1.7	6.3	29.8	13.8	54.3	13.1	32.6	1.65	19.0	12.4	
	38-50	2Bt4	0.2	0.7	5.4	34.7	15.5	56.5	17.3	26.2	1.70	15.7	10.7	
	50-63	2Bt5	0.5	0.7	5.0	36.6	17.3	60.1	17.4	22.5	1.69	14.6	9.2	
	63-71	2Bt6	0.3	0.6	9.0	42.6	14.6	67.1	13.0	19.9	1.64	13.7	8.1	
	71-83	3Bct	2.6	2.4	8.9	29.0	14.8	57.7	19.3	23.0	1.71	9.7	9.1	
	83-86	3BC	0.9	1.2	18.3	49.6	6.7	76.7	8.8	14.5	---	---	6.3	
	86-94	4C1	0.2	1.3	7.8	33.9	22.4	65.6	16.7	17.7	---	---	8.5	
Uhland: 1,13 (S94TX-395-001)	94-106	4C2	0.4	0.9	18.0	55.2	7.5	82.0	6.0	12.0	---	---	6.3	
	106-137	5C1	0.1	0.2	6.0	52.0	20.8	79.1	12.0	8.9	---	---	3.7	
	137-152	5C2	TR	0.3	1.8	36.7	29.2	68.0	18.1	13.9	---	---	6.8	
	152-162	5C3	0.3	0.6	3.1	45.3	23.7	73.0	15.3	11.7	---	---	5.8	
	162	5C4	---	---	---	---	---	---	---	---	---	---	10.3	
	0-3	A	1.4	0.8	1.1	17.1	20.7	41.1	34.2	24.7	1.38	23.9	---	
	3-15	Bw	0.0	0.2	0.8	26.5	40.1	67.6	22.9	9.5	1.51	13.8	---	
	15-22	Ab	0.1	0.1	0.3	15.9	33.6	50.0	34.7	15.3	1.42	16.4	---	
	22-43	Bwb	0.0	0.0	0.6	32.5	37.8	70.9	16.2	12.9	1.42	13.6	---	
	43-48	A'b	0.0	0.1	1.1	33.3	31.2	65.7	23.6	10.7	---	---	---	
	48-55	Bgb	0.0	0.1	1.1	30.8	30.0	62.0	26.3	11.7	---	---	---	
	55-80	A''b	0.0	0.3	0.9	15.2	21.3	37.7	32.4	29.9	1.54	20.6	---	

See footnotes at end of table

Table 18.—Physical Analyses of Selected Soils—Continued

Soil name, footnotes, and sample number	Depth	Horizon	Particle-size distribution (percent less than 2 mm)										Water content	
			Sand						Clay <0.002 (mm)	Silt (0.05- (mm)	Bulk density 1/3 bar			
			Very coarse (2-1 mm)	Coarse (1-0.5 mm)	Medium (0.5- mm)	Fine (0.25- mm)	Very fine (0.1- mm)	Total (0.05 mm)						
	In		Pct	Pct	Pct	Pct	Pct	Pct	Pct	Pct	g/cc	Pct	Pct	
Weswood: 1,13 (S93TX-395-001)	0-4	Ap	0.6	0.7	1.8	4.6	18.7	26.4	53.7	19.9	1.35	30.2	---	
	4-12	Bw1	0.1	0.2	0.4	3.0	26.3	30.0	48.2	21.8	1.34	29.8	---	
	12-26	Bw2	0.0	0.1	0.3	5.3	50.0	55.7	32.0	12.3	1.31	28.6	---	
	26-36	Bck	0.1	0.1	0.1	2.0	25.6	27.9	51.9	20.2	1.29	29.7	---	
	36-40	2Bwb1	0.0	0.0	0.1	0.3	6.1	6.5	61.1	32.4	1.20	35.3	---	
	40-54	2Bwb2	0.1	0.1	0.2	0.3	3.5	4.2	61.9	33.9	1.28	32.4	---	
	54-64	2Bwb3	0.0	0.1	0.1	0.3	18.2	18.7	61.0	20.3	1.23	34.2	---	
	64-70	3Ab1	0.0	0.1	0.1	0.5	3.8	4.5	50.3	45.2	1.26	37.1	---	
	70-80	4Ab2	0.1	0.2	0.2	0.8	6.9	8.2	49.0	42.8	1.18	43.6	---	

- 1 Analysis by the Soil Characterization Laboratory, Texas Agricultural Experiment Station, College Station, Texas.
- 2 Cation-exchange capacity class of this pedon is 0.545, which is marginal to the superactive class (0.60).
- 3 Smectitic mineralogy assumes an activity class of superactive; therefore, this pedon is a taxadjunct to the series.
- 4 Location: From the intersection of U.S. Highway 79 and Farm Road 46 in Franklin, Texas, 8.9 miles northwest on Farm Road 46, about 4.3 miles west on County Road 452, about 0.2 mile north on County Road 427, about 0.5 mile west on County Road 130, about 600 feet north, in improved pasture.
- 5 Location: From the intersection of U.S. Highway 79 and Farm Road 46 in Franklin, Texas, 5.0 miles northwest on Farm Road 46, about 2.1 miles west on Farm Road 979, about 2.7 miles northwest on County Road 129, about 2.6 miles southwest on County Road 127, about 0.8 mile southwest on a private road, 1,300 feet west in woodland.
- 6 Laboratory data supports the classification of this pedon in the Axtell series. However, it was mapped as an inclusion within a map unit of Edge soils because of its very limited acreage.
- 7 Location: From the intersection of U.S. Highway 79 and Farm Road 46 in Franklin, Texas, 8.9 miles northwest on Farm Road 46, about 3.9 miles west on County Road 452, about 700 feet north, in improved pasture.
- 8 Analysis by the National Soil Survey Laboratory, Natural Resources Conservation Service, Lincoln, Nebraska.
- 9 Taxadjunct to the series; the pedon has smectitic mineralogy.
- 10 Taxadjunct to the series; clay content decreases by more than 20 percent from the maximum within 60 inches of the surface and mineralogy is siliceous.
- 11 Location: From the intersection of U.S. Highway 79 and Farm Road 46 in Franklin, Texas, 5.0 miles northwest on Farm Road 46, about 2.1 miles west on Farm Road 979, about 2.7 miles northwest on County Road 129, about 2.6 miles southwest on County Road 127, about 0.8 mile southwest on a private road, 800 feet west in improved pasture.
- 12 Taxadjunct to the series; the pedon classifies in the Typic subgroup (more than 75 percent base saturation throughout the argillic horizon).
- 13 Location: From the intersection of U.S. Highway 79 and Farm Road 46 in Franklin, Texas, 5.0 miles northwest on Farm Road 46, about 2.1 miles west on Farm Road 979, about 2.7 miles northwest on County Road 129, about 2.6 miles southwest on County Road 127, about 0.8 mile southwest on a private road, 800 feet north in improved pasture.
- 14 Location of the pedon sampled is the same as that of the typical pedon described in the section "Soil Series and Their Morphology."

Table 19.—Chemical Analyses of Selected Soils

(Analyses were made by the Soil Characterization Laboratory, Texas Agricultural Experiment Station, College Station, Texas, and by the National Soil Survey Laboratory, Natural Resources Conservation Service, Lincoln, Nebraska. CEC means cation-exchange capacity; Base SAT means base saturation; ESP means exchangeable sodium percentage; and TR means trace)

Soil name footnote number, and laboratory sample number	Depth	Horizon	Extractable bases (milliequivalents per 100 grams of soil)				CEC	Base saturation	Reaction 1:1 H ₂ O	Organic carbon	Electrical conductivity	Sodium absorption ratio	ESP
			Ca	Mg	K	Na							
	In							Pct	pH	Pct	mmhos/cm		
Crockett: 1,2,3 (S86TX-395-001)	0-4	Ap	8.0	3.2	0.4	0.2	11.8	100	6.1	0.98	---	---	2
	4-7	A	6.5	2.2	0.2	0.2	10.8	84	6.3	0.47	---	---	2
	7-15	Bt1	15.8	5.4	0.3	1.2	25.6	89	6.5	0.59	---	---	5
	15-22	Bt2	15.6	5.1	0.2	1.6	23.4	96	6.6	0.40	0.5	5	6
	22-30	Bt3	15.9	5.3	0.2	2.0	22.1	100	7.2	0.36	1.1	6	7
	30-36	Bt4	18.3	5.8	0.2	2.3	22.4	100	7.8	0.33	1.3	6	8
	36-48	Bt5	18.9	5.3	0.2	2.3	19.5	100	7.9	0.28	1.3	7	9
	48-60	2Btb1	12.6	4.4	0.2	1.9	15.5	100	7.9	0.12	1.3	7	9
	60-80	2Btb2	9.2	3.7	0.2	1.7	14.5	100	7.8	0.07	1.1	7	9
Edge: 1,4,5 (S86TX-395-002)	0-5	Ap	0.0	0.3	0.2	0.0	4.2	12	4.7	0.65	---	---	0
	5-15	Bt1	8.5	6.9	0.3	0.7	26.5	62	4.8	0.53	---	---	3
	15-25	Bt2	7.4	5.6	0.3	0.9	19.6	73	5.2	0.36	---	---	5
	25-41	Bt3	10.4	6.3	0.3	1.3	21.2	86	6.1	0.14	---	---	6
	41-54	Bt4	17.0	7.5	0.3	1.8	25.3	100	8.2	0.17	0.5	5	6
	54-66	BC	11.2	5.9	0.2	1.7	18.1	100	8.1	0.13	---	---	10
	66-80	C	22.4	13.3	0.4	4.1			7.8	0.11	0.8	7	
Edge: 2,6,7 (S91TX-395-003)	0-2	A	6.6	1.5	0.4	0.1	8.0	100	5.7	2.05	0.74	TR	1
	2-5	E	2.7	0.9	0.3	---	5.1	76	6.0	0.58	0.14	TR	TR
	5-10	Bt1	9.5	9.9	0.6	0.8	25.3	82	4.8	0.53	0.63	3	2
	10-15	Bt	9.6	6.0	0.4	1.2	48.5	35	4.6	0.28	1.10	4	2
	15-20	Btz1	15.2	8.6	0.4	1.8	26.8	97	5.0	0.30	1.24	4	5
	20-26	Btz2	16.6	8.5	0.3	1.9	26.0	100	6.6	0.33	1.43	4	5
	26-32	Btzk1	21.1	7.9	0.3	1.8	22.5	100	7.6	0.18	1.25	5	6
	32-43	Btzk2	17.6	7.7	0.3	1.8	23.2	100	8.0	0.05	1.02	5	6
	43-52	Bck	11.1	5.7	0.3	1.4	15.8	100	8.0	0.07	0.91	5	7
	52-67	Ck	17.2	8.2	0.3	2.2	23.7	100	8.0	0.05	1.16	6	7
	67-80	C	17.9	6.1	0.3	2.3	17.6	100	7.9	0.07	1.70	7	10

See footnotes at end of table.

Table 19.—Chemical Analyses of Selected Soils—Continued

Soil name footnote number, and laboratory sample number	Depth	Horizon	Extractable bases (milliequivalents per 100 grams of soil)				CEC	Base satura- tion	Reaction 1:1 H ₂ O	Organic carbon	Electrical conduc- tivity	Sodium absorp- tion ratio	ESP
			Ca	Mg	K	Na							
	In												
Rader: 8,9,10 (S91TX-395-002)	0-4	Ap	1.3	0.3	0.1	0.1	2.7	67	6.2	0.67	0.15	---	5
	4-9	A	1.2	0.4	0.1	0.1	2.1	86	5.6	0.21	0.05	---	5
	9-14	E1	1.2	0.4	0.1	0.1	2.1	86	5.7	0.13	0.03	---	7
	14-18	E2	1.6	0.7	TR	0.1	2.8	86	5.7	0.11	0.04	---	4
	18-22	Bt/E	5.6	2.3	0.1	0.6	10.3	83	5.8	0.27	0.05	---	6
	22-31	Bt	10.9	4.9	0.3	1.3	20.2	86	5.7	0.26	0.08	---	6
	31-41	Btz	11.9	5.0	0.2	1.5	18.5	100	6.8	0.23	0.14	---	8
	41-50	Btkz	13.6	4.9	0.2	1.7	17.4	100	8.0	0.13	0.87	6	8
	50-60	Btz	12.5	5.1	0.3	2.1	18.2	100	8.0	0.09	1.35	7	9
	60-71	BC1	12.1	4.8	0.3	2.1	17.5	100	7.9	0.06	1.51	7	10
	71-106	BC2	10.2	4.1	0.3	1.9	14.9	100	7.9	0.04	0.94	7	10
	106-121	BC3	10.7	3.9	0.3	2.0	16.1	100	7.5	0.05	1.05	8	10
Silawa: 8,11,12 (S91TX-395-001)	0-5	Ap	2.1	0.5	0.2	TR	3.3	85	5.3	0.88	0.22	---	---
	5-8	A	1.1	0.5	0.1	TR	1.9	89	5.7	0.26	0.06	---	---
	8-11	E	1.2	0.5	0.1	TR	1.9	95	6.0	0.19	0.05	---	---
	11-19	Bt1	6.3	2.2	0.5	0.1	10.4	87	6.3	0.35	0.05	---	---
	19-34	Bt2	6.4	3.2	0.2	0.1	11.2	88	6.5	0.28	0.05	---	---
	34-38	2Bt3	5.3	3.3	0.2	0.1	11.0	81	5.5	0.21	0.07	---	---
	38-50	2Bt4	5.0	3.2	0.1	0.1	9.6	87	5.2	0.14	0.07	---	---
	50-63	2Bt5	4.7	3.3	0.2	0.1	9.4	88	5.4	0.09	0.05	---	---
	63-71	2Bt6	4.5	3.2	0.1	0.1	8.7	91	5.6	0.06	0.04	---	---
	71-83	3Bct	5.4	4.0	0.2	0.1	10.6	92	5.6	0.07	0.04	---	---
	83-86	3Bc	3.4	2.8	0.1	0.1	7.2	89	5.5	0.04	0.04	---	---
	86-94	4C1	4.4	3.8	0.1	0.1	9.0	93	5.7	0.05	0.03	---	---
	94-106	4C2	2.8	2.3	0.1	0.1	5.4	98	5.8	0.03	0.03	---	---
	106-137	5C1	2.6	1.9	TR	0.1	4.6	100	6.1	0.03	0.03	---	---
	137-152	5C2	4.8	3.0	0.1	0.1	8.1	99	6.1	0.01	0.03	---	---
	152-162	5C3	4.3	2.7	0.1	0.1	7.2	100	6.3	0.01	0.03	---	---
Uhland: 1,13 (S94TX-395-001)	162	5C4							5.0	0.05	0.03	---	---
	0-3	A	24.7	5.8	0.3	0.7	22.7	100	6.3	2.40	1.8	2	2
	3-15	Bw	4.2	2.9	0.1	0.4	7.2	100	6.4	0.42	1.0	4	3
	15-22	Ab	6.5	5.1	0.1	0.7	10.6	100	6.3	0.60	1.4	4	4
	22-43	Bwb	5.4	4.7	0.1	0.7	8.3	100	6.5	0.17	1.9	4	5
	43-48	A'b	4.7	3.4	0.0	0.7	6.5	100	6.4	0.34	2.6	4	5
	48-55	Bgb	4.4	3.4	0.0	0.7	6.3	100	6.3	0.19	2.7	3	6
	55-80	A'b	21.8	8.6	0.2	1.3	19.6	100	5.9	0.33	1.1	4	5

See footnotes at end of table.

Table 19.—Chemical Analyses of Selected Soils—Continued

Soil name footnote number, and laboratory sample number	Depth	Horizon	Extractable bases (milliequivalents per 100 grams of soil)				CEC	Base saturation	Reaction 1:1 H ₂ O	Organic carbon	Electrical conductivity	Sodium absorption ratio	ESP
			Ca	Mg	K	Na							
	In							Pct	pH	Pct	mmhos/cm		
Weswood: 1, 13 (S93TX-395-001)	0-4	Ap	42.9	1.8	1.2	0.1	21.3	100	7.3	2.23	1.0	0	0
	4-12	Bw1	40.3	1.7	1.0	0.1	16.6	100	7.7	1.14	---	---	1
	12-26	Bw2	39.7	1.8	0.5	0.1	9.0	100	7.8	0.13	---	---	1
	26-36	Bck	35.9	3.6	0.2	0.3	12.2	100	7.9	0.45	---	---	2
	36-40	2Bwb1	41.3	6.1	0.4	0.5	22.2	100	7.9	0.66	0.5	0	2
	40-54	2Bwb2	42.9	5.4	0.4	0.7	19.4	100	7.9	0.75	0.5	1	3
	54-64	2Bwb3	38.2	5.5	0.3	0.6	13.9	100	7.9	0.44	---	---	4
	64-70	3Ab1	50.8	5.4	0.6	1.9	26.5	100	7.8	0.85	0.7	5	6
	70-80	4Ab2	38.9	4.5	0.6	2.7	31.8	100	7.9	1.41	0.7	6	7

- 1 Analysis by the Soil Characterization Laboratory, Texas Agricultural Experiment Station, College Station, Texas.
- 2 Cation-exchange capacity class of this pedon is 0.545, which is marginal to the superactive class (0.60). Smectitic mineralogy assumes an activity class of superactive; therefore, this pedon is a taxadjunct to the series.
- 3 Location: From the intersection of U.S. Highway 79 and Farm Road 46 in Franklin, Texas, 8.9 miles northwest on Farm Road 46, about 4.3 miles west on County Road 130, about 600 feet north, in improved pasture.
- 4 Laboratory data supports the classification of this pedon in the Axtell series. However, it was mapped as an inclusion within a map unit of Edge soils because of its very limited acreage.
- 5 Location: From the intersection of U.S. Highway 79 and Farm Road 46 in Franklin, Texas, 8.9 miles northwest on Farm Road 46, about 3.9 miles west on County Road 452, about 700 feet north, in improved pasture.
- 6 Taxadjunct to the series; the pedon has smectitic mineralogy.
- 7 Location: From the intersection of U.S. Highway 79 and Farm Road 46 in Franklin, Texas, 5.0 miles northwest on Farm Road 46, about 2.1 miles west on Farm Road 979, about 2.7 miles northwest on County Road 129, about 2.6 miles southwest on County Road 127, about 0.8 mile southwest on a private road, 1,300 feet west in woodland.
- 8 Analysis by the National Soil Survey Laboratory, Natural Resources Conservation Service, Lincoln, Nebraska.
- 9 Taxadjunct to the series; clay content decreases by more than 20 percent from the maximum within 60 inches of the surface and mineralogy is siliceous.
- 10 Location: From the intersection of U.S. Highway 79 and Farm Road 46 in Franklin, Texas, 5.0 miles northwest on Farm Road 46, about 2.1 miles west on Farm Road 979, about 2.7 miles northwest on County Road 129, about 2.6 miles southwest on County Road 127, about 0.8 mile southwest on a private road, 800 feet west in improved pasture.
- 11 Taxadjunct to the series; the pedon classifies in the Typic subgroup (there is more than 75 percent base saturation throughout the argillic horizon).
- 12 Location: From the intersection of U.S. Highway 79 and Farm Road 46 in Franklin, Texas, 5.0 miles northwest on Farm Road 46, about 2.1 miles west on Farm Road 979, about 2.7 miles northwest on County Road 129, about 2.6 miles southwest on County Road 127, about 0.8 mile southwest on a private road, 800 feet north in improved pasture.
- 13 Location of the pedon sampled is the same as that of the typical pedon described in the section "Soil Series and Their Morphology."

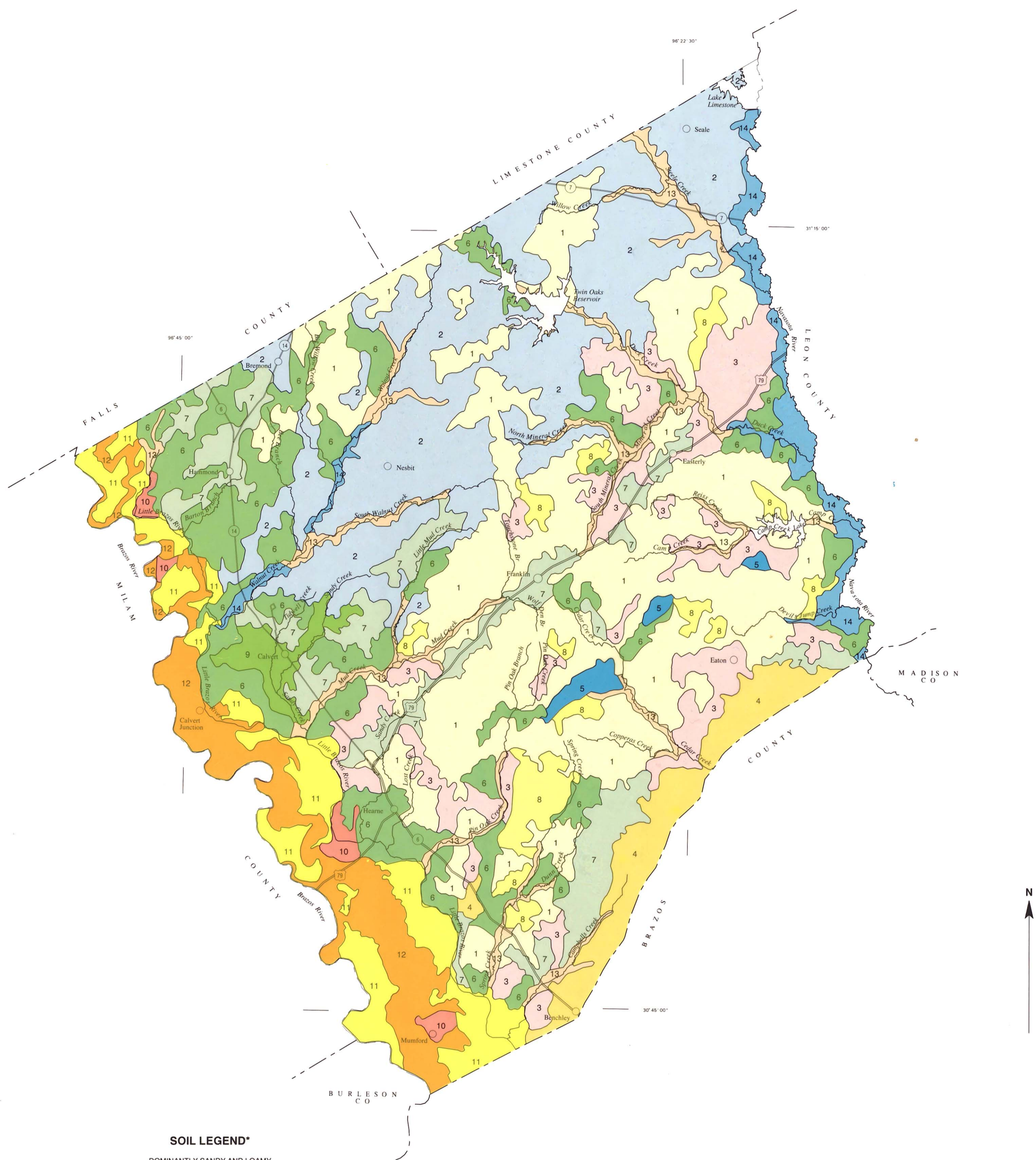
Soil Survey of Robertson County, Texas

Table 20.—Classification of the Soils

Soil name	Family or higher taxonomic class
Arenosa-----	Thermic, uncoated Ustic Quartzipsamments
Bastrop-----	Fine-loamy, mixed, active, thermic Udic Paleustalfs
Benchley-----	Fine, smectitic, thermic Udertic Argiustolls
Bremond-----	Fine, smectitic, thermic Udertic Paleustalfs
Burleson-----	Fine, smectitic, thermic Udic Haplusterts
Cadelake-----	Sandy, siliceous, thermic Typic Humaquepts
Chazos-----	Fine, smectitic, thermic Udic Paleustalfs
Coarsewood-----	Coarse-silty, mixed, superactive, calcareous, thermic Udic Ustifluvents
Crockett-----	Fine, smectitic, thermic Udertic Paleustalfs
Desan-----	Loamy, siliceous, active, thermic Grossarenic Paleustalfs
Dimebox-----	Fine, smectitic, thermic Udic Haplusterts
Dutek-----	Loamy, siliceous, active, thermic Arenic Haplustalfs
Edge-----	Fine, mixed, active, thermic Udic Paleustalfs
Eufaula-----	Siliceous, thermic Psammentic Paleustalfs
Gaddy-----	Sandy, mixed, thermic Udic Ustifluvents
Gasil-----	Fine-loamy, siliceous, semiactive, thermic Ultic Paleustalfs
Hammond-----	Fine-loamy, mixed, superactive, nonacid, thermic Udic Ustorthents
Hearne-----	Fine, mixed, semiactive, thermic Typic Haplustulfs
Highbank-----	Fine, mixed, active, thermic Udertic Haplustepts
Lexton-----	Fine, mixed, active, thermic Udic Haplustalfs
Lufkin-----	Fine, smectitic, active, thermic Oxyaquic Vertic Paleustalfs
Luling-----	Fine, smectitic, thermic Udic Haplusterts
Margie-----	Fine, mixed, semiactive, thermic Udic Haplustalfs
Navasota-----	Fine, smectitic, thermic Aeris Endoaquerts
Oletha-----	Fine-loamy, siliceous, superactive, thermic Aquic Haplustepts
Padina-----	Loamy, siliceous, active, thermic Grossarenic Paleustalfs
Rader-----	Fine-loamy, mixed, semiactive, thermic Aquic Paleustalfs
Robco-----	Loamy, siliceous, active, thermic Aquic Arenic Paleustalfs
Roetex-----	Very fine, mixed, active, thermic Aquic Hapluderts
Rosanky-----	Fine, mixed, semiactive, thermic Ultic Paleustalfs
Sandow-----	Fine-loamy, siliceous, superactive, thermic Udifluventic Haplustepts
Ships-----	Very fine, mixed, active, thermic Chromic Hapluderts
Silawa-----	Fine-loamy, siliceous, semiactive, thermic Ultic Haplustalfs
Silstid-----	Loamy, siliceous, semiactive, thermic Arenic Paleustalfs
Spiller-----	Fine, mixed, semiactive, thermic Ultic Paleustalfs
Tabor-----	Fine, smectitic, thermic Oxyaquic Vertic Paleustalfs
Uhland-----	Coarse-loamy, siliceous, superactive, thermic Aquic Haplustepts
Weswood-----	Fine-silty, mixed, superactive, thermic Udifluventic Haplustepts
Whitesboro-----	Fine-loamy, mixed, superactive, thermic Cumulic Haplustolls
Wilson-----	Fine, smectitic, thermic Oxyaquic Vertic Haplustalfs
Yahola-----	Coarse-loamy, mixed, superactive, calcareous, thermic Udic Ustifluvents
Zilaboy-----	Fine, smectitic, thermic Oxyaquic Hapluderts

NRCS Accessibility Statement

The Natural Resources Conservation Service (NRCS) is committed to making its information accessible to all of its customers and employees. If you are experiencing accessibility issues and need assistance, please contact our Helpdesk by phone at 1-800-457-3642 or by e-mail at ServiceDesk-FTC@ftc.usda.gov. For assistance with publications that include maps, graphs, or similar forms of information, you may also wish to contact our State or local office. You can locate the correct office and phone number at <http://offices.sc.egov.usda.gov/locator/app>.



SOIL LEGEND*

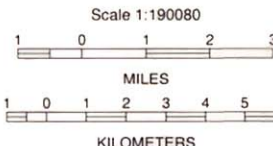
- DOMINANTLY SANDY AND LOAMY SAVANNAH SOILS ON UPLANDS
- 1 Silsby-Padina-Robco
 - 2 Edge-Crockett
 - 3 Hearn-Rosanky-Gasil
- DOMINANTLY LOAMY AND CLAYEY PRAIRIE SOILS ON UPLANDS
- 4 Benchley-Luling
 - 5 Margie-Crockett
- DOMINANTLY SANDY, LOAMY, AND CLAYEY SOILS ON TERRACES
- 6 Chazos-Dutek-Silawa
 - 7 Tabor-Gasil-Rader
 - 8 Eufaula-Robco
 - 9 Bremond-Wilson
 - 10 Bastrop-Burleson
- DOMINANTLY LOAMY AND CLAYEY SOILS ON FLOOD PLAINS
- 11 Ships-Highbank
 - 12 Weswood-Yahola-Coarsewood
 - 13 Uhland-Sandow-Whitesboro
 - 14 Zilaboy-Navasota-Oletha

*The units on this legend are described in the text under the heading "General Soil Map Units."

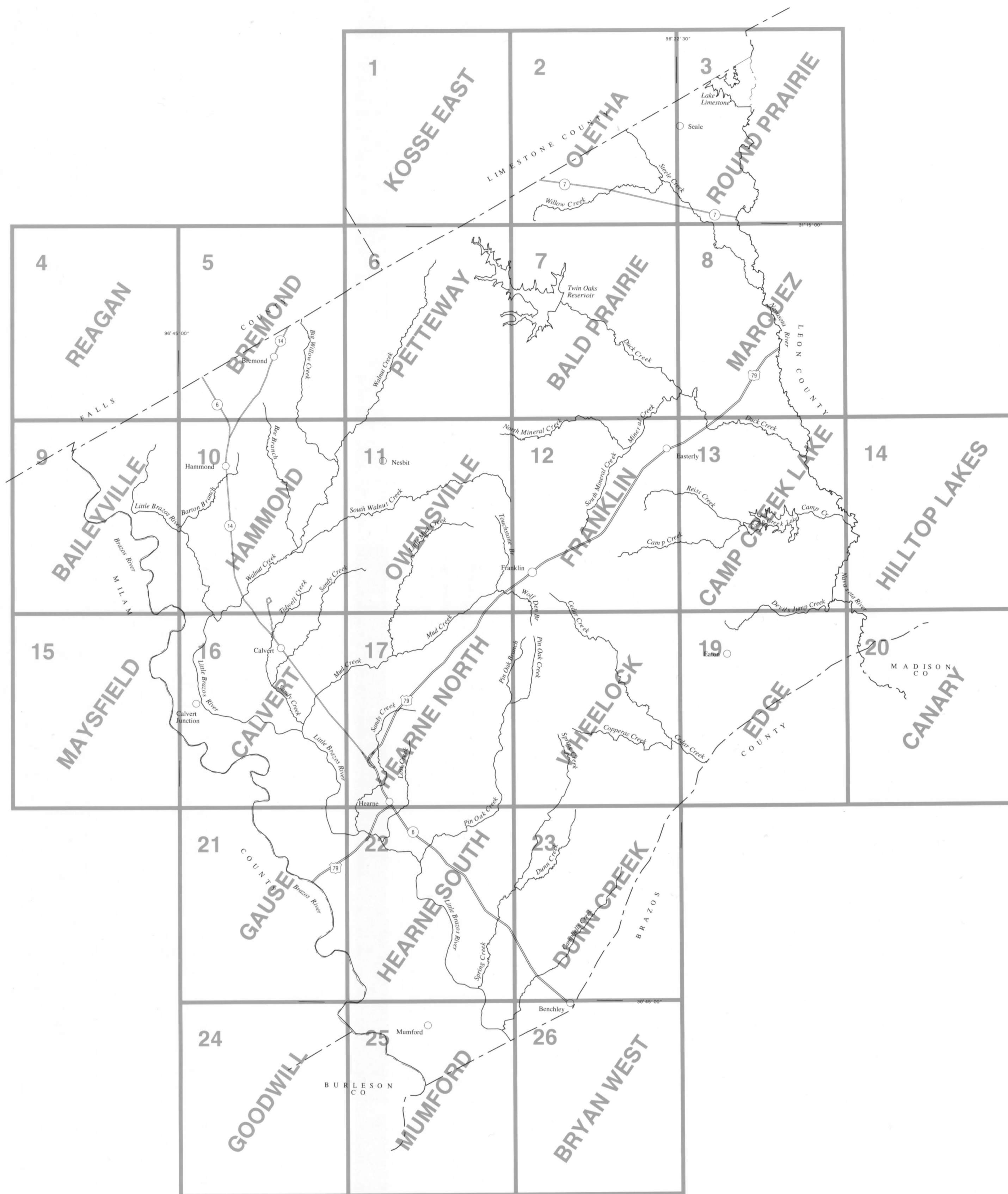
Compiled 1999

UNITED STATES DEPARTMENT OF AGRICULTURE
NATURAL RESOURCES CONSERVATION SERVICE
TEXAS AGRICULTURAL EXPERIMENT STATION
TEXAS STATE SOIL AND WATER CONSERVATION BOARD

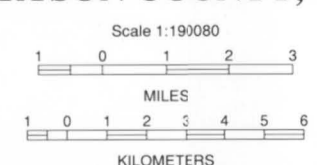
**GENERAL SOIL MAP
ROBERTSON COUNTY, TEXAS**



Each area outlined on this map consists of more than one kind of soil. The map is thus meant for general planning rather than a basis or decisions on the use of specific tracts.



INDEX TO MAP SHEETS
ROBERTSON COUNTY, TEXAS



SOIL LEGEND

Map symbols consist of a combination of letters and numbers. The first capital letter is the initial one of the soil name. The second is a lowercase letter. The third is a capital letter that indicates slope. Symbols without a slope letter are for nearly level soils or miscellaneous areas. Symbols that are all capital letters represent miscellaneous areas. The fourth symbol, when used, is a number and shows that the soil is eroded.

SYMBOL	NAME
AaD	Arenosa fine sand, 1 to 8 percent slopes
BaB	Bastrop fine sandy loam, 1 to 3 percent slopes
BeB	Benchley clay loam, 1 to 3 percent slopes
BeC	Benchley clay loam, 3 to 5 percent slopes
BrB	Bremond fine sandy loam, 1 to 3 percent slopes
BsA	Bremond-Wilson complex, 0 to 1 percent slopes
BuA	Burleson clay, 0 to 1 percent slopes
CaA	Cadelake fine sandy loam, 0 to 2 percent slopes
ChC	Chazos loamy fine sand, 1 to 5 percent slopes
CoA	Coarsewood silt loam, 0 to 1 percent slopes, rarely flooded
CoB	Coarsewood silt loam, 1 to 3 percent slopes, rarely flooded
CrB	Crockett loam, 1 to 3 percent slopes
CrC2	Crockett loam, 2 to 5 percent slopes, eroded
DAM	Dam
DfC	Desan loamy fine sand, 1 to 5 percent slopes
DmB	Dimebox clay, 1 to 3 percent slopes
DuB	Dutek loamy fine sand, 1 to 3 percent slopes
DuD	Dutek loamy fine sand, 3 to 8 percent slopes
EdC	Edge fine sandy loam, 1 to 5 percent slopes
EdC2	Edge fine sandy loam, 2 to 5 percent slopes, eroded
EdD2	Edge fine sandy loam, 5 to 8 percent slopes, eroded
EgD	Edge-Gullied land complex, 3 to 8 percent slopes
EuC	Eufaula loamy fine sand, 1 to 5 percent slopes
Ga	Gaddy loamy fine sand, 0 to 2 percent slopes, frequently flooded
GsB	Gasil loamy fine sand, 1 to 5 percent slopes
GsD	Gasil loamy fine sand, 5 to 8 percent slopes
HaB	Hammond fine sandy loam, 1 to 3 percent slopes
HaE	Hammond fine sandy loam, 5 to 15 percent slopes
HeD	Hearne fine sandy loam, 3 to 8 percent slopes
HeE	Hearne fine sandy loam, 8 to 20 percent slopes
HnD	Hearne fine sandy loam, 1 to 8 percent slopes, graded
HnE	Hearne fine sandy loam, 5 to 20 percent slopes, very stony
HrD	Hearne gravelly fine sandy loam, 3 to 8 percent slopes
HsA	Highbank silty clay loam, 0 to 1 percent slopes, rarely flooded
LeC	Lexton clay loam, 3 to 5 percent slopes
LeE	Lexton clay loam, 5 to 12 percent slopes
LfA	Lufkin loam, 0 to 1 percent slopes
LuB	Luling clay, 1 to 3 percent slopes
LuC	Luling clay, 3 to 5 percent slopes
MgB	Margie fine sandy loam, 1 to 3 percent slopes
Na	Navasota clay, 0 to 1 percent slopes, frequently flooded
Nd	Navasota clay, 0 to 1 percent slopes, depressional
Ot	Oletha clay, 0 to 1 percent slopes, frequently flooded
PaC	Padina loamy fine sand, 1 to 5 percent slopes
PaE	Padina loamy fine sand, 5 to 15 percent slopes
Pt	Pits and Dumps
RaA	Rader fine sandy loam, 0 to 2 percent slopes
RoB	Robco loamy fine sand, 1 to 3 percent slopes
Rr	Roetex clay, 0 to 1 percent slopes, frequently flooded
RsC	Rosanky fine sandy loam, 2 to 5 percent slopes
RsD	Rosanky fine sandy loam, 5 to 8 percent slopes
RvC2	Rosanky fine sandy loam, 3 to 5 percent slopes, eroded
Sa	Sandow loam, 0 to 2 percent slopes, frequently flooded
ShA	Ships clay, 0 to 1 percent slopes, rarely flooded
ShB	Ships clay, 1 to 3 percent slopes, rarely flooded
Sk	Ships clay, 0 to 1 percent slopes, frequently flooded
SmC	Silawa loamy fine sand, 2 to 5 percent slopes
SmD	Silawa loamy fine sand, 5 to 8 percent slopes
SnB	Silstid loamy fine sand, 1 to 3 percent slopes
SnD	Silstid loamy fine sand, 3 to 8 percent slopes
SpB	Spiller fine sandy loam, 1 to 3 percent slopes
TaA	Tabor fine sandy loam, 0 to 2 percent slopes
Uh	Uhland loam, 0 to 1 percent slopes, frequently flooded
W	Water
WeA	Weswood silt loam, 0 to 1 percent slopes, rarely flooded
WwA	Weswood silty clay loam, 0 to 1 percent slopes, rarely flooded
WwB	Weswood silty clay loam, 1 to 3 percent slopes, rarely flooded
Wx	Weswood-Yahola complex, 0 to 3 percent slopes, frequently flooded
Wy	Whitesboro clay loam, 0 to 1 percent slopes, frequently flooded
WzA	Wilson loam, 0 to 1 percent slopes
YaA	Yahola fine sandy loam, 0 to 2 percent slopes, rarely flooded
Zb	Zilaboy clay, 0 to 1 percent slopes, frequently flooded

CONVENTIONAL AND SPECIAL
SYMBOLS LEGEND

CULTURAL FEATURES	SPECIAL SYMBOLS FOR SOIL SURVEY
BOUNDARIES	MISCELLANEOUS CULTURAL FEATURES
County or parish	Church
Minor civil division	School
Field sheet matchline and neatline	
ROADS	WATER FEATURES
Trail, normally not shown	DRAINAGE
ROAD EMBLEM & DESIGNATIONS	Perennial stream
Federal	Intermittent stream
State	Drainage end (indicates direction of flow)
County, farm or ranch	MISCELLANEOUS WATER FEATURES
PITS	LAKES, PONDS AND RESERVOIRS
Gravel pit	Marsh or swamp
	Wet spot
	SOIL DELINEATIONS AND SYMBOLS
	SOIL SAMPLE (normally not shown)
	MISCELLANEOUS
	Gravelly spot
	Rock outcrop
	Sandy spot

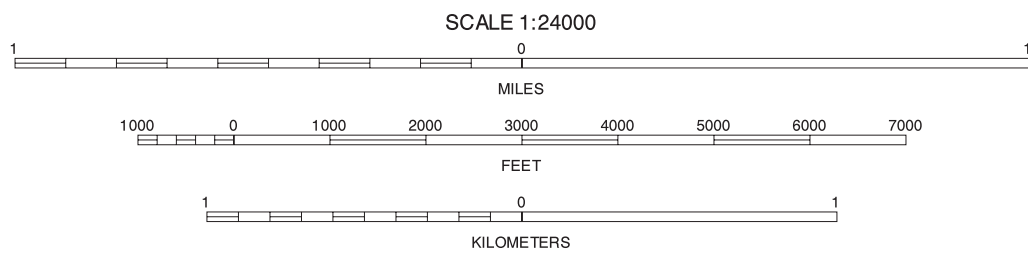


Joins sheet 5,
Brewing

This soil survey was compiled by the U.S. Department of Agriculture, Natural Resources Conservation Service, formerly Soil Conservation Service. Base maps are orthophotographs prepared by the Natural Resources Conservation Service, from 1995 aerial photography. Hydrography and cultural layers were acquired from the Natural Resources Conservation Service. The hydrography and cultural layers were edited to conform with features represented on the publication orthophotography and to enhance the clarity of the soils information.

North American Datum of 1983 (NAD83). GRS-80 Spheroid 1000 meter fcs: Universal Transverse Mercator, zone 14. Coordinate grid ticks and land division data, if shown, are approximately positioned. Digital data are available for this quadrangle.

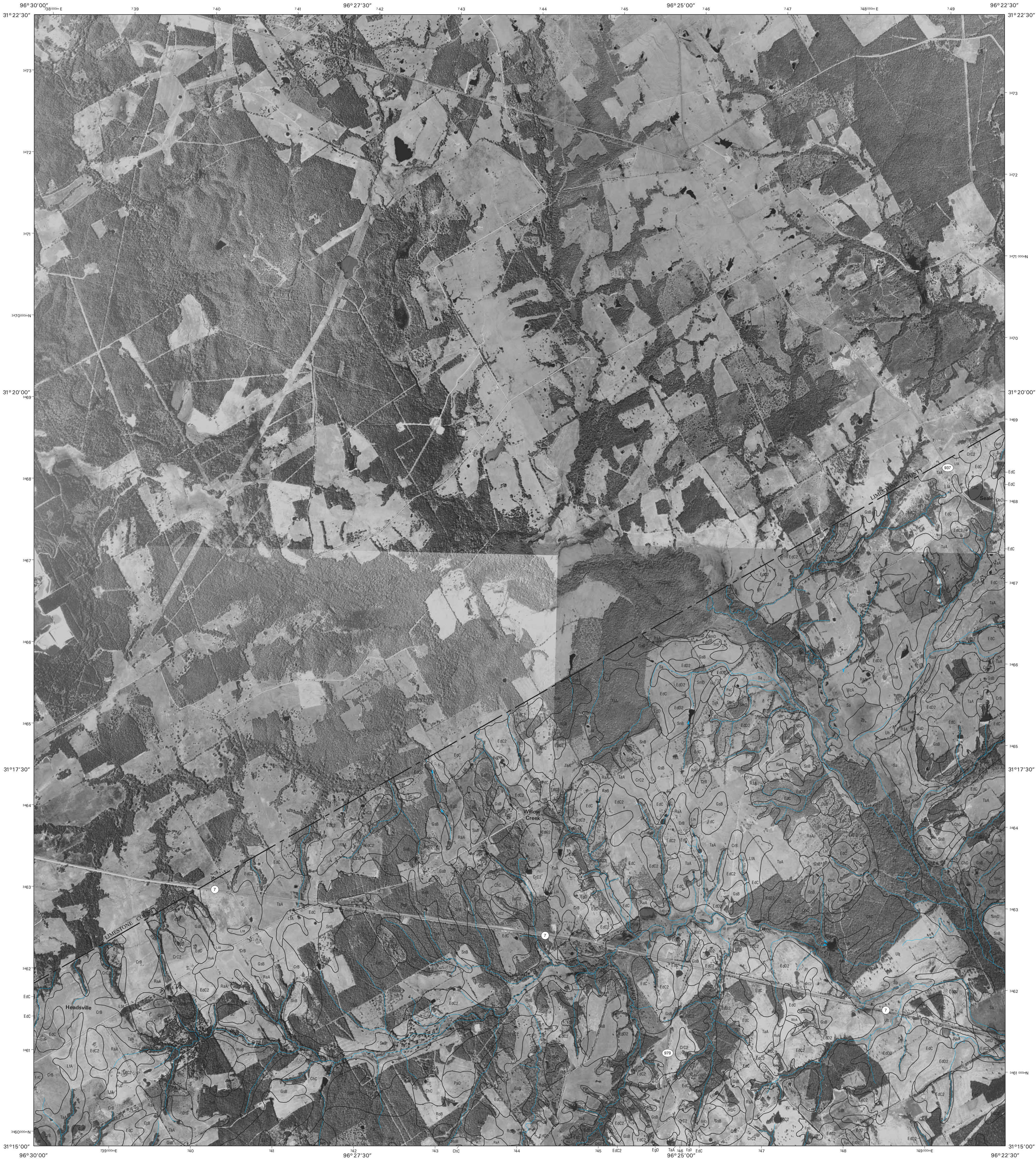
NORTH



QUADRANGLE LOCATION

KOSSE EAST, TEXAS
7.5 MINUTE SERIES
SHEET NUMBER 1 OF 26

Joins sheet 7,
Boggs River



Joins sheet 1, Kosse East

Joins sheet 3, Round Prairie

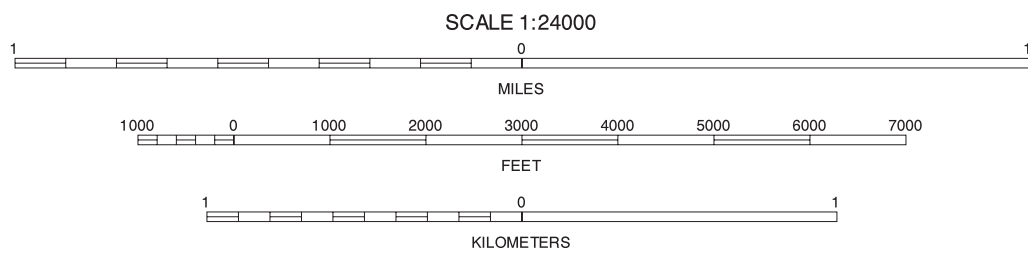
Joins sheet 6, Pathway

Joins sheet 8, Marquette

This soil survey was compiled by the U.S. Department of Agriculture, Natural Resources Conservation Service, formerly Soil Conservation Service. Base maps are orthophotographs prepared by the Natural Resources Conservation Service, from 1995 aerial photography. Hydrography and cultural layers were acquired from the Natural Resources Conservation Service. The hydrography and cultural layers were edited to conform with features represented on the publication orthophotography and to enhance the clarity of the soils information.

North American Datum of 1983 (NAD83), GRS-80 Spheroid 1000 meter fcs: Universal Transverse Mercator, zone 14. Coordinate grid ticks and land division data, if shown, are approximately positioned. Digital data are available for this quadrangle.

NORTH



QUADRANGLE LOCATION

OLETHA, TEXAS
7.5 MINUTE SERIES
SHEET NUMBER 2 OF 26



Joins sheet 2, Clifton

Joins sheet 7, Blue Prairie

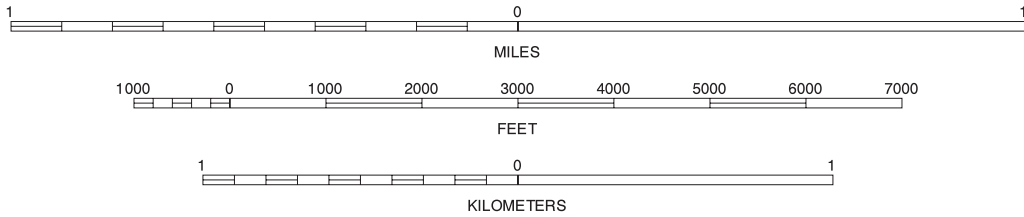
Joins sheet 8, Marquez

This soil survey was compiled by the U.S. Department of Agriculture, Natural Resources Conservation Service, formerly Soil Conservation Service. Base maps are orthophotographs prepared by the Natural Resources Conservation Service, from 1995 aerial photography. Hydrography and cultural layers were acquired from the Natural Resources Conservation Service. The hydrography and cultural layers were edited to conform with features represented on the publication orthophotography and to enhance the clarity of the soils information.

North American Datum of 1983 (NAD83), GRS-80 Spheroid 1000 meter fcs: Universal Transverse Mercator, zone 14. Coordinate grid ticks and land division data, if shown, are approximately positioned. Digital data are available for this quadrangle.

NORTH

SCALE 1:24000



QUADRANGLE LOCATION

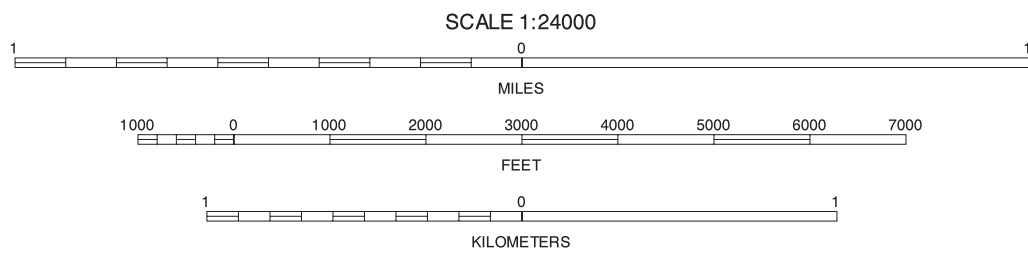
ROUND PRAIRIE, TEXAS
7.5 MINUTE SERIES
SHEET NUMBER 3 OF 26



This soil survey was compiled by the U.S. Department of Agriculture, Natural Resources Conservation Service, formerly Soil Conservation Service. Base maps are orthophotographs prepared by the Natural Resources Conservation Service, from 1995 aerial photography. Hydrography and cultural layers were acquired from the Natural Resources Conservation Service. The hydrography and cultural layers were edited to conform with features represented on the publication orthophotography and to enhance the clarity of the soils information.

North American Datum of 1983 (NAD83). GRS-80 Spheroid 1000 meter ticks: Universal Transverse Mercator, zone 14. Coordinate grid ticks and land division data, if shown, are approximately positioned. Digital data are available for this quadrangle.

NORTH



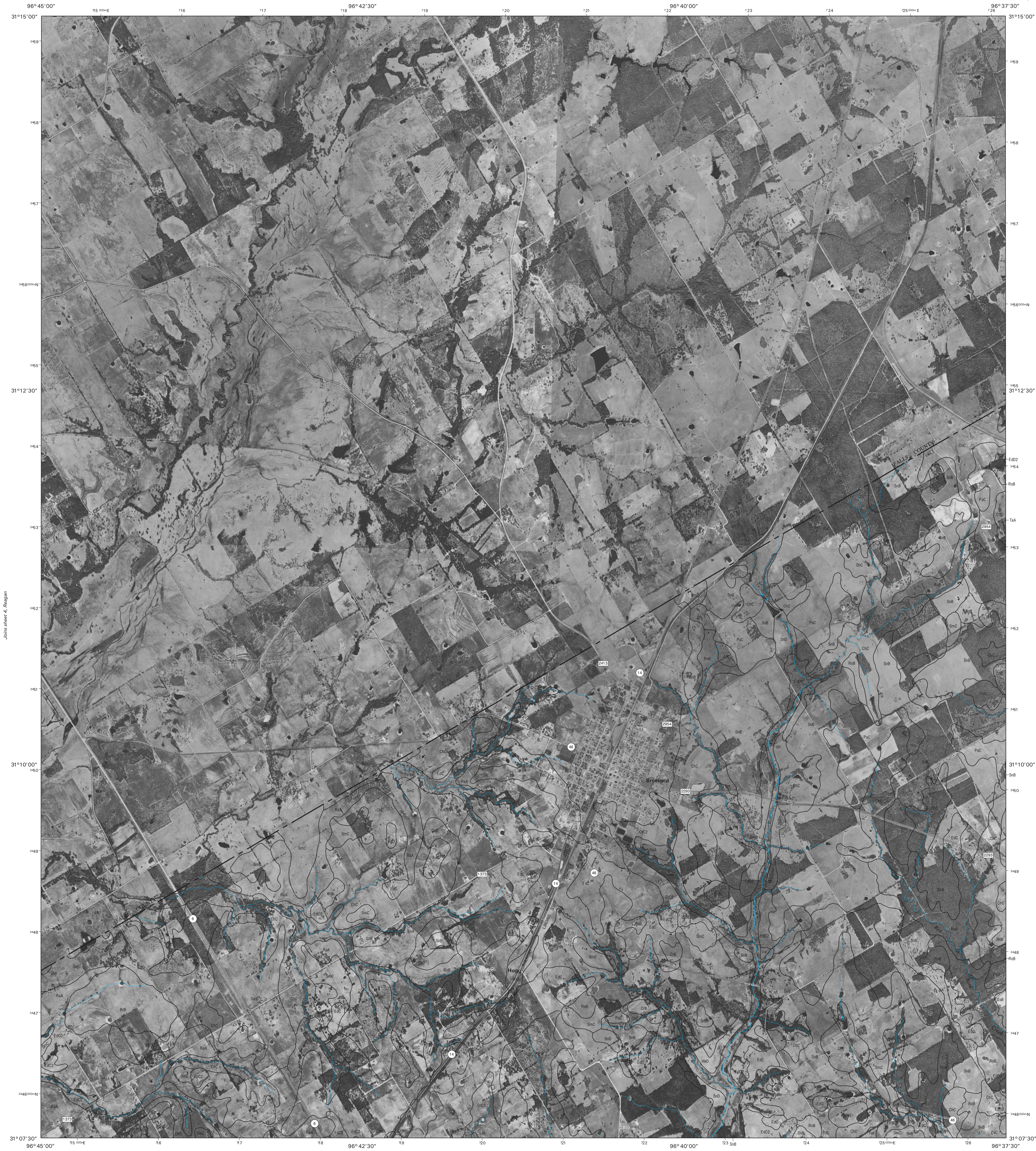
QUADRANGLE LOCATION

REAGAN, TEXAS
7.5 MINUTE SERIES
SHEET NUMBER 4 OF 26

Join sheet 10
Hunting

Join sheet 5, Bremond

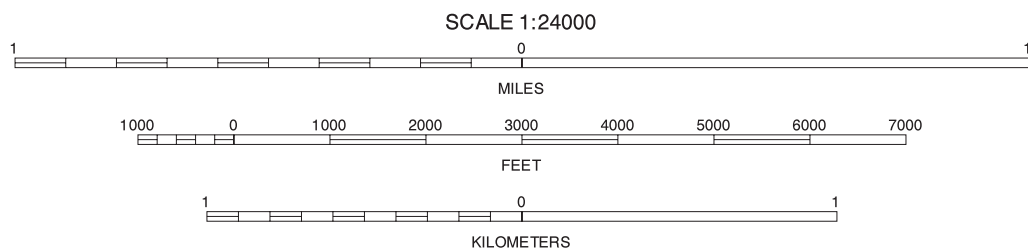
Join sheet 9, Baileyville



This soil survey was compiled by the U.S. Department of Agriculture, Natural Resources Conservation Service, formerly Soil Conservation Service. Base maps are orthophotographs prepared by the Natural Resources Conservation Service, from 1995 aerial photography. Hydrography and cultural layers were acquired from the Natural Resources Conservation Service. The hydrography and cultural layers were edited to conform with features represented on the publication orthophotography and to enhance the clarity of the soils information.

North American Datum of 1983 (NAD83). GRS-80 Spheroid 1000 meter fcs: Universal Transverse Mercator, zone 14. Coordinate grid ticks and land division data, if shown, are approximately positioned. Digital data are available for this quadrangle.

NORTH

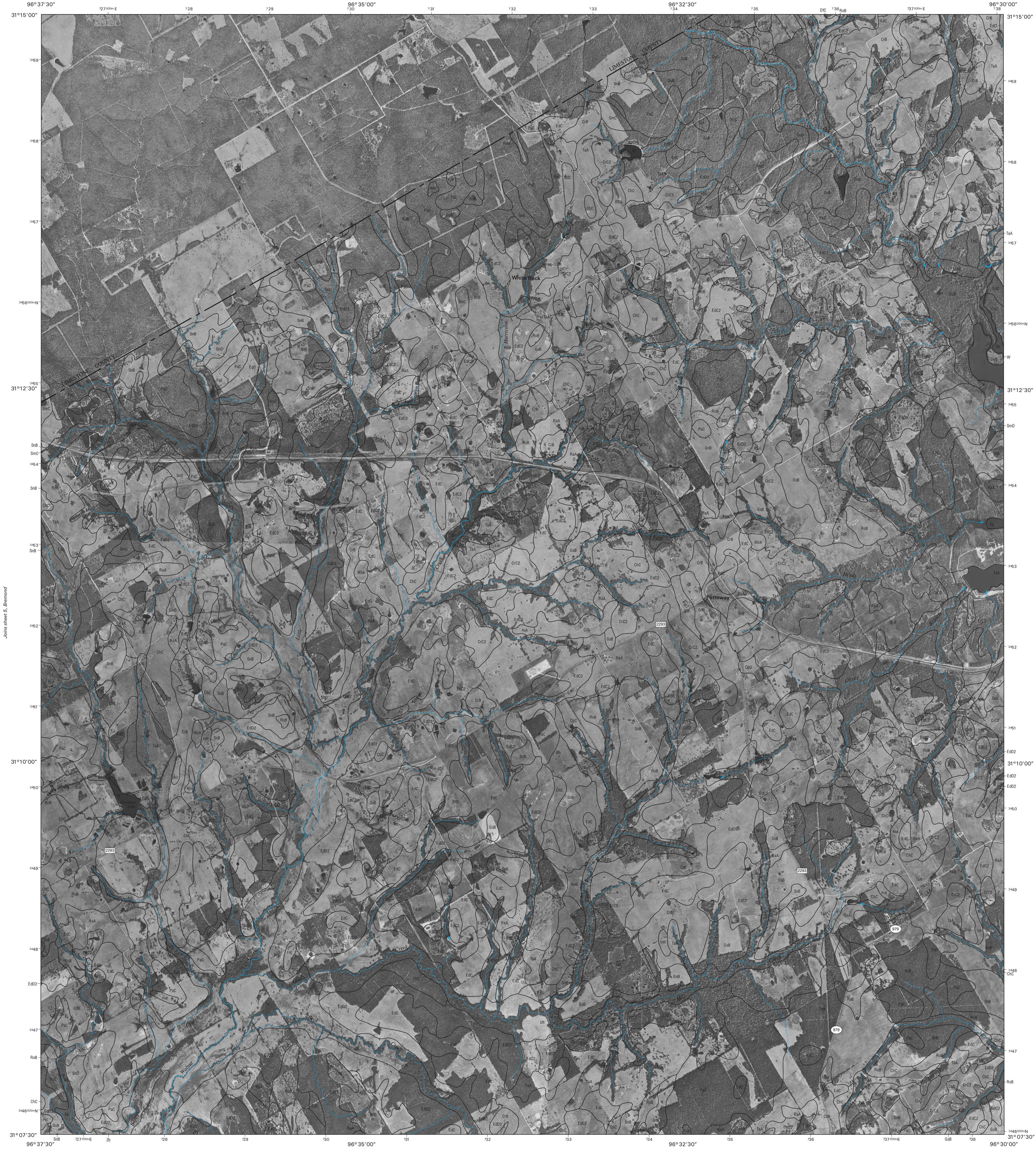


QUADRANGLE LOCATION

BREMOND, TEXAS
7.5 MINUTE SERIES
SHEET NUMBER 5 OF 26

Joins sheet 1, Kosse East

Joins sheet 2,
Olmstead



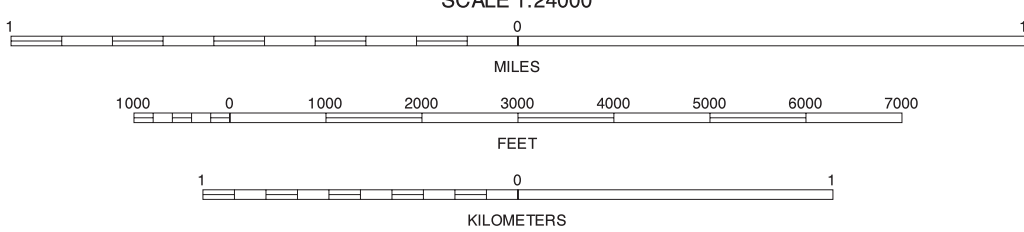
This soil survey was compiled by the U.S. Department of Agriculture, Natural Resources Conservation Service, formerly Soil Conservation Service. Base maps are orthophotographs prepared by the Natural Resources Conservation Service, from 1995 aerial photography. Hydrography and cultural layers were acquired from the Natural Resources Conservation Service. The hydrography and cultural layers were edited to conform with features represented on the publication orthophotography and to enhance the clarity of the soils information.

North American Datum of 1983 (NAD83). GRS-80 Spheroid 1000 meter fcs: Universal Transverse Mercator, zone 14. Coordinate grid ticks and land division data, if shown, are approximately positioned. Digital data are available for this quadrangle.

NORTH

Joins sheet 11, Owensville

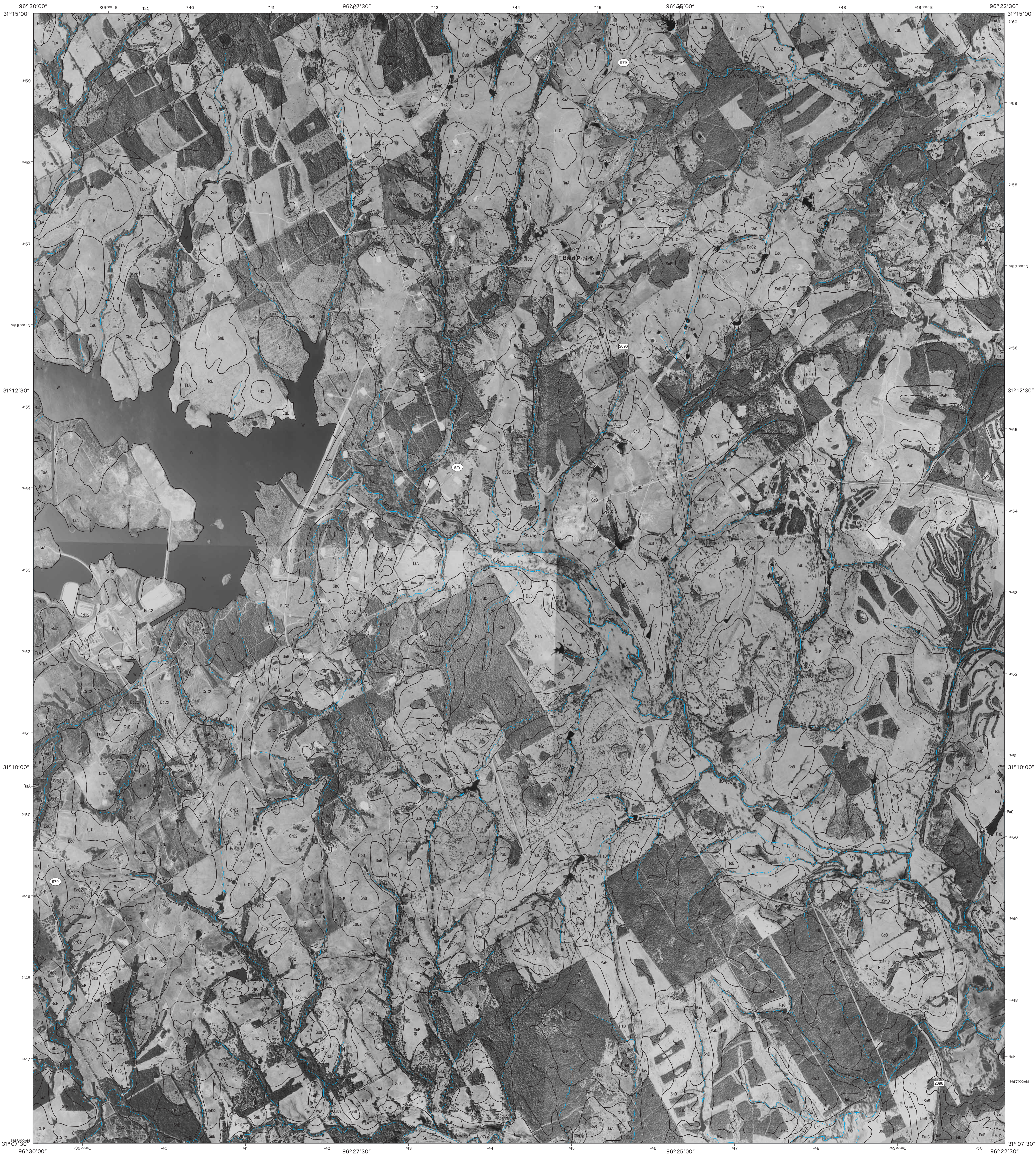
SCALE 1:24000



QUADRANGLE LOCATION

PETTEWAY, TEXAS
7.5 MINUTE SERIES
SHEET NUMBER 6 OF 26

Joins sheet 12,
Petteway

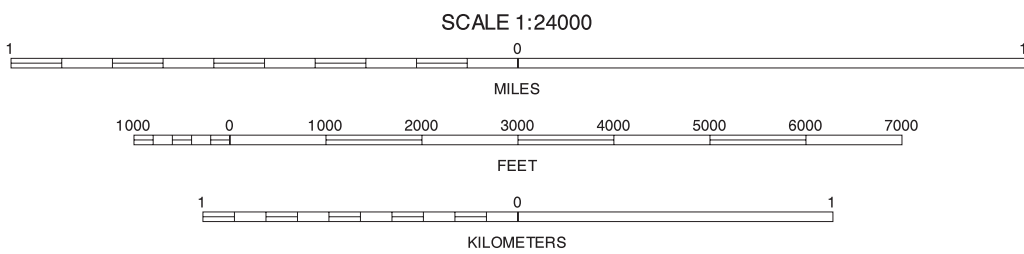


This soil survey was compiled by the U.S. Department of Agriculture, Natural Resources Conservation Service, formerly Soil Conservation Service. Base maps are orthophotographs prepared by the Natural Resources Conservation Service, from 1995 aerial photography. Hydrography and cultural layers were acquired from the Natural Resources Conservation Service. The hydrography and cultural layers were edited to conform with features represented on the publication orthophotography and to enhance the clarity of the soils information.

North American Datum of 1983 (NAD83). GRS-80 Spheroid 1000 meter fcs: Universal Transverse Mercator, zone 14. Coordinate grid ticks and land division data, if shown, are approximately positioned. Digital data are available for this quadrangle.



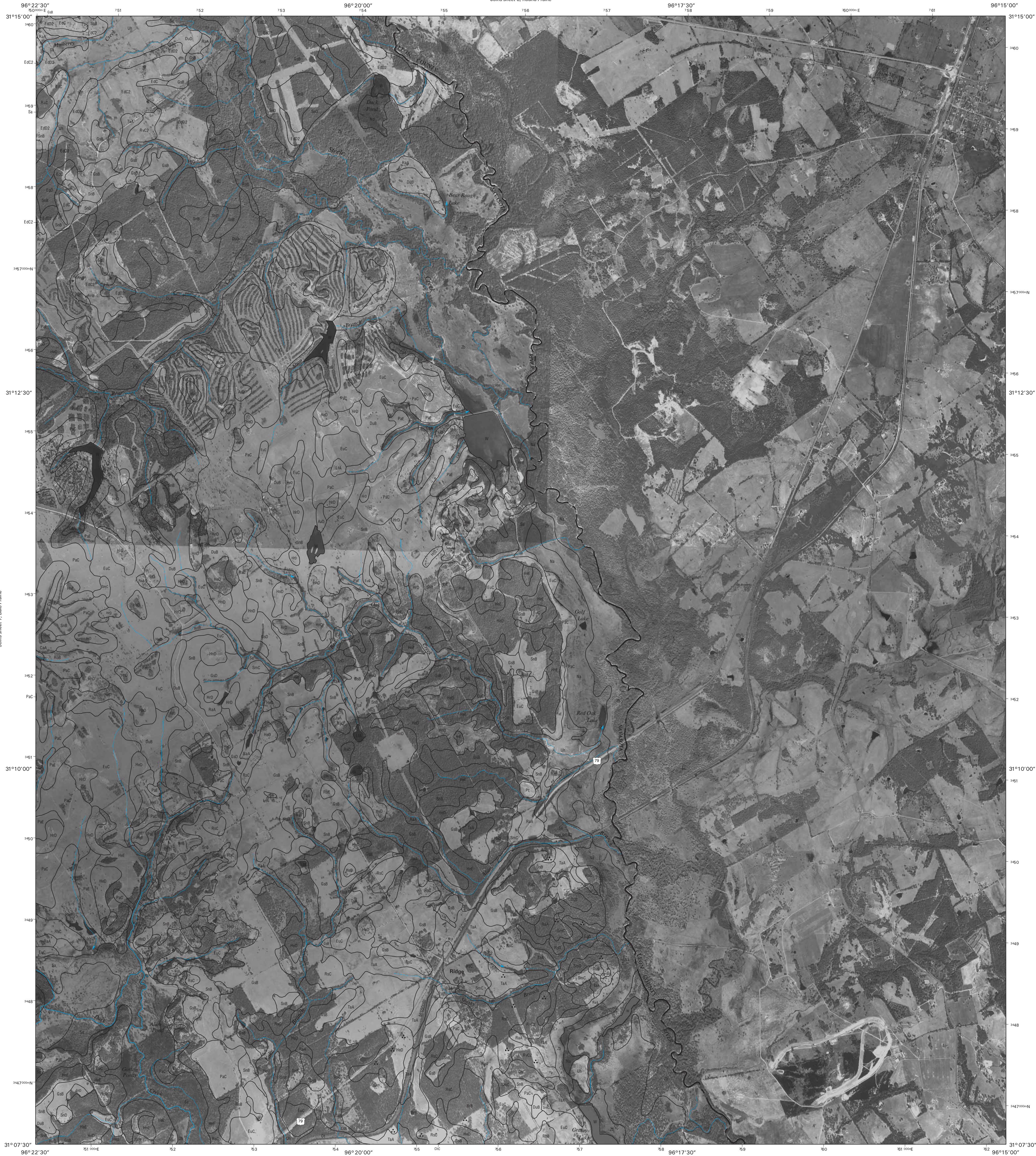
QUADRANGLE LOCATION



1	2	3
4	5	
6	7	8

INDEX TO ADJOINING 7.5 MAPS

BALD PRAIRIE, TEXAS
7.5 MINUTE SERIES
SHEET NUMBER 7 OF 26

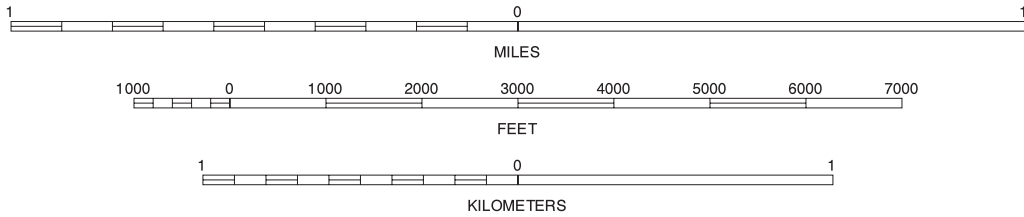


This soil survey was compiled by the U.S. Department of Agriculture, Natural Resources Conservation Service, formerly Soil Conservation Service. Base maps are orthophotographs prepared by the Natural Resources Conservation Service, from 1995 aerial photography. Hydrography and cultural layers were acquired from the Natural Resources Conservation Service. The hydrography and cultural layers were edited to conform with features represented on the publication orthophotography and to enhance the clarity of the soils information.

North American Datum of 1983 (NAD83). GRS-80 Spheroid 1000 meter ticks: Universal Transverse Mercator, zone 14. Coordinate grid ticks and land division data, if shown, are approximately positioned. Digital data are available for this quadrangle.

NORTH

SCALE 1:24000

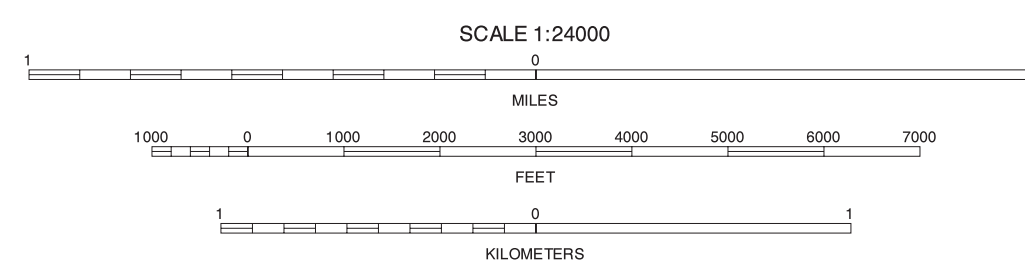


QUADRANGLE LOCATION

MARQUEZ, TEXAS
7.5 MINUTE SERIES
SHEET NUMBER 8 OF 26



North American Datum of 1983 (NAD83). GRS-80 Spheroid
1000 meter tics: Universal Transverse Mercator, zone 14. Coordinate
grid tics and land division data, if shown, are approximately
positioned. Digital data are available for this quadrangle.



Joins sheet 5, Bremond

Joins sheet 16, Calvert

Joins sheet 9, Baileyville

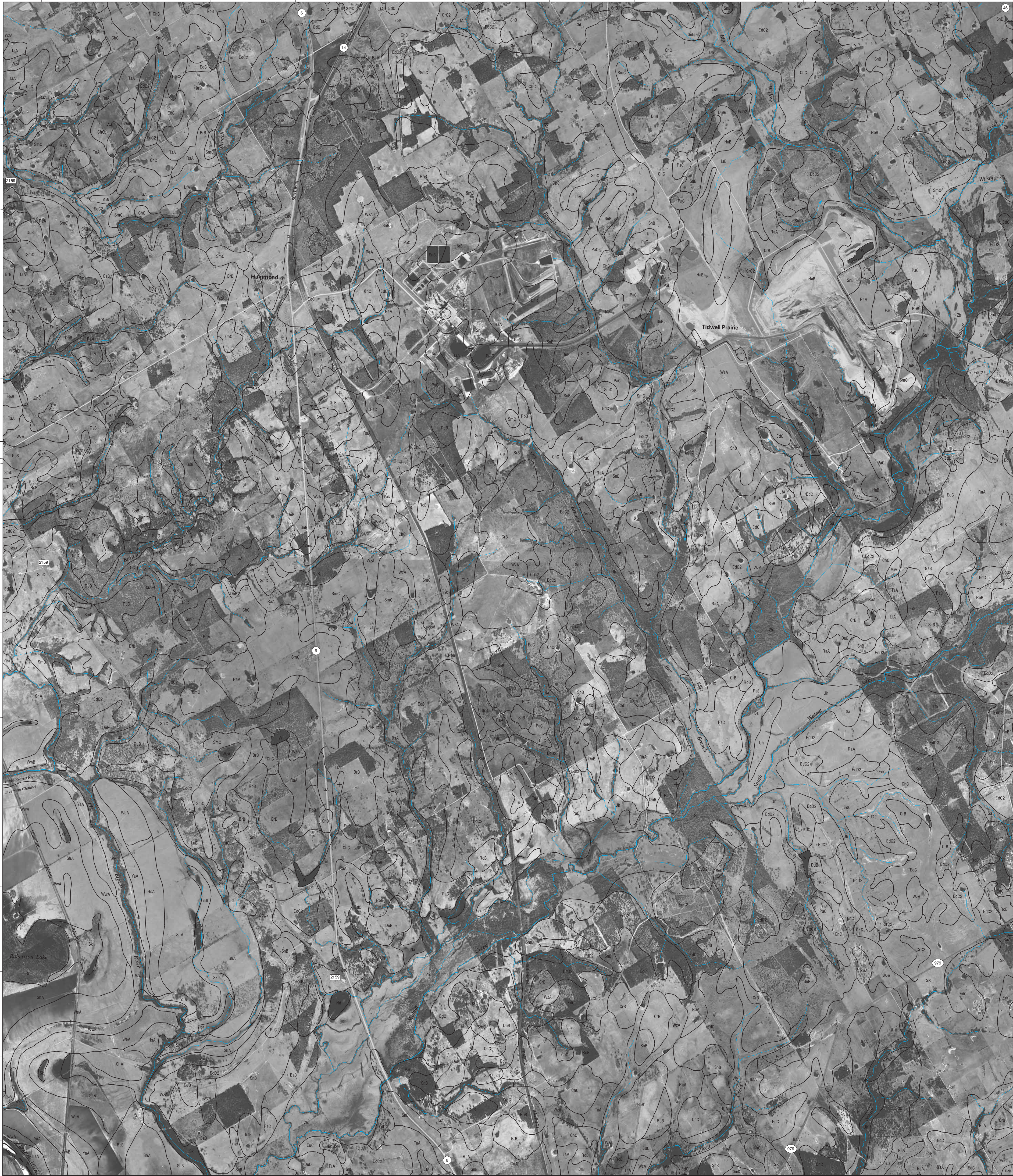
Joins sheet 11, Owensville

Joins sheet 4,
Rogersville

Joins sheet 6,
Perryway

Joins sheet 15,
Mayfield

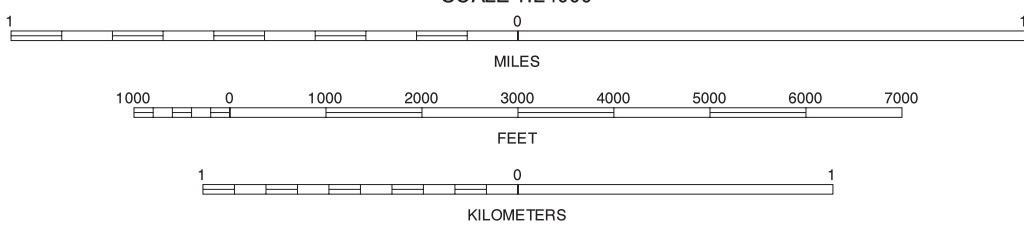
Joins sheet 12,
Harris North



This soil survey was compiled by the U.S. Department of Agriculture, Natural Resources Conservation Service, formerly Soil Conservation Service. Base maps are orthophotographs prepared by the Natural Resources Conservation Service, from 1995 aerial photography. Hydrography and cultural layers were acquired from the Natural Resources Conservation Service. The hydrography and cultural layers were edited to conform with features represented on the publication orthophotography and to enhance the clarity of the soils information.

North American Datum of 1983 (NAD83). GRS-80 Spheroid 1000 meter ticks: Universal Transverse Mercator, zone 14. Coordinate grid ticks and land division data, if shown, are approximately positioned. Digital data are available for this quadrangle.

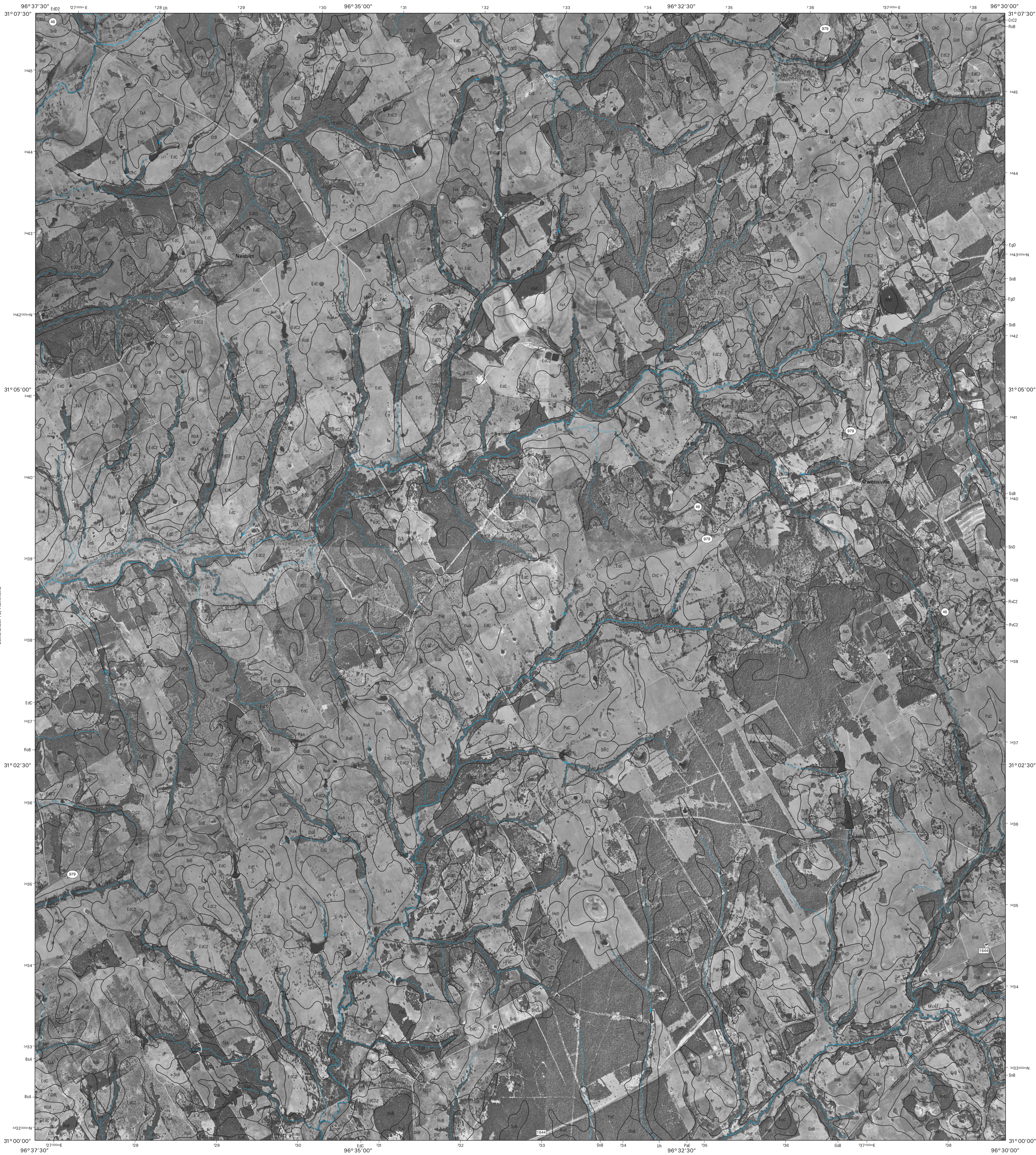
NORTH



QUADRANGLE LOCATION

HAMMOND, TEXAS
7.5 MINUTE SERIES
SHEET NUMBER 10 OF 26

Joins sheet 6, Pettaway

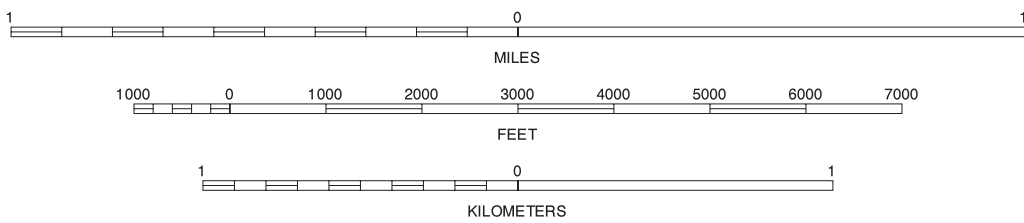


This soil survey was compiled by the U.S. Department of Agriculture, Natural Resources Conservation Service, formerly Soil Conservation Service. Base maps are orthophotographs prepared by the Natural Resources Conservation Service, from 1995 aerial photography. Hydrography and cultural layers were acquired from the Natural Resources Conservation Service. The hydrography and cultural layers were edited to conform with features represented on the publication orthophotography and to enhance the clarity of the soils information.

North American Datum of 1983 (NAD83). GRS-80 Spheroid 1000 meter ticks: Universal Transverse Mercator, zone 14. Coordinate grid ticks and land division data, if shown, are approximately positioned. Digital data are available for this quadrangle.

Joins sheet 17, Hearne North

SCALE 1:24000

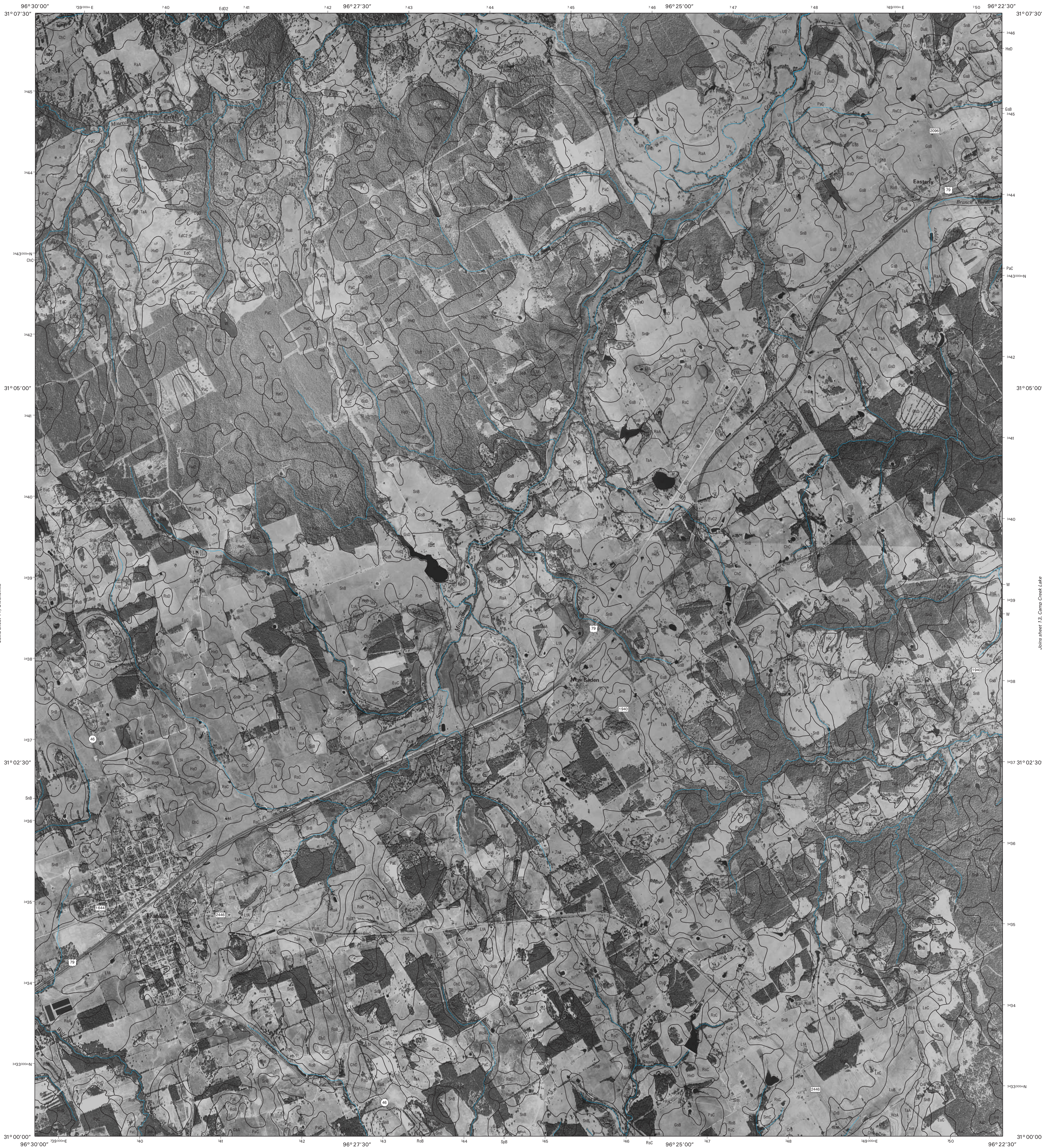


OWENSVILLE, TEXAS
7.5 MINUTE SERIES
SHEET NUMBER 11 OF 26

QUADRANGLE LOCATION

Joins sheet 7, Bald Prairie

Joins sheet 9,
Monroe



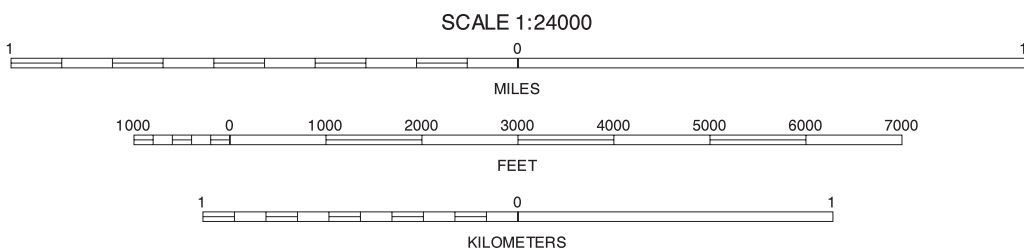
Joins sheet 18, Wheelock

Joins sheet 19,
Edge

This soil survey was compiled by the U.S. Department of Agriculture, Natural Resources Conservation Service, formerly Soil Conservation Service. Base maps are orthophotographs prepared by the Natural Resources Conservation Service, from 1995-1996 aerial photography. Hydrography and cultural layers were acquired from the Natural Resources Conservation Service. The hydrography and cultural layers were edited to conform with features represented on the publication orthophotography and to enhance the clarity of the soils information.

North American Datum of 1983 (NAD83). GRS-80 Spheroid 1000 meter ticks: Universal Transverse Mercator, zone 14. Coordinate grid ticks and land division data, if shown, are approximately positioned. Digital data are available for this quadrangle.

NORTH



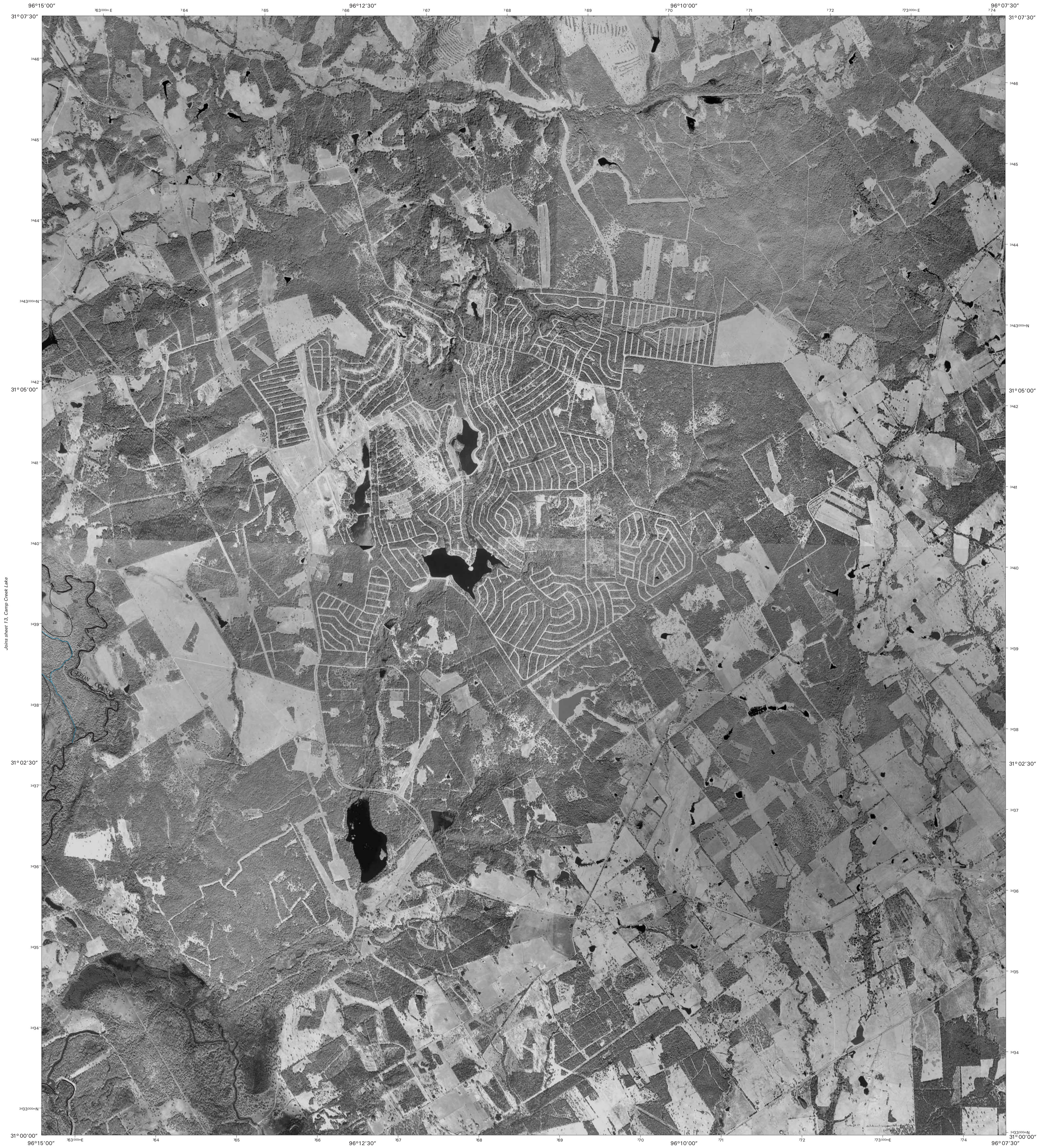
QUADRANGLE LOCATION

FRANKLIN, TEXAS
7.5 MINUTE SERIES
SHEET NUMBER 12 OF 26

Join sheet 8,
Hilltop Lakes

UNITED STATES
DEPARTMENT OF AGRICULTURE
NATURAL RESOURCES CONSERVATION SERVICE

ROBERTSON COUNTY, TEXAS
HILLTOP LAKES QUADRANGLE
SHEET NUMBER 14 OF 26



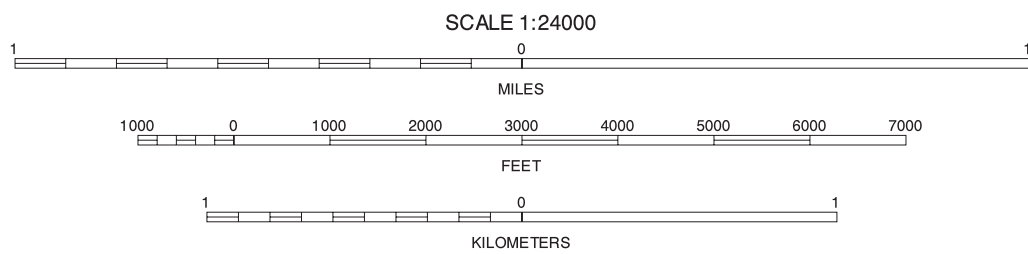
Join sheet 13, Camp Creek Lake

Join sheet 19,
Edge

This soil survey was compiled by the U.S. Department of Agriculture, Natural Resources Conservation Service, formerly Soil Conservation Service. Base maps are orthophotographs prepared by the Natural Resources Conservation Service, from 1995 aerial photography. Hydrography and cultural layers were acquired from the Natural Resources Conservation Service. The hydrography and cultural layers were edited to conform with features represented on the publication orthophotography and to enhance the clarity of the soils information.

North American Datum of 1983 (NAD83). GRS-80 Spheroid 1000 meter ticks. Universal Transverse Mercator, zone 14. Coordinate grid ticks and land division data, if shown, are approximately positioned. Digital data are available for this quadrangle.

NORTH



QUADRANGLE LOCATION

HILLTOP LAKES, TEXAS
7.5 MINUTE SERIES
SHEET NUMBER 14 OF 26

Joins sheet 9, Baileyville

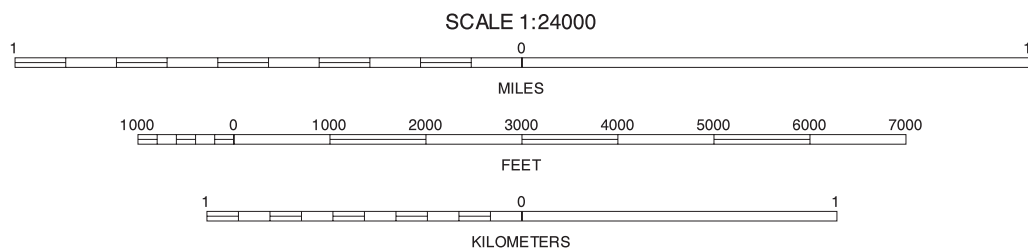
Joins sheet 10,
Hammill



This soil survey was compiled by the U.S. Department of Agriculture, Natural Resources Conservation Service, formerly Soil Conservation Service. Base maps are orthophotographs prepared by the Natural Resources Conservation Service, from 1995 aerial photography. Hydrography and cultural layers were acquired from the Natural Resources Conservation Service. The hydrography and cultural layers were edited to conform with features represented on the publication orthophotography and to enhance the clarity of the soils information.

North American Datum of 1983 (NAD83), GRS-90 Spheroid
1000 meter ticks: Universal Transverse Mercator, zone 14. Coordinate grid ticks and land division data, if shown, are approximately positioned. Digital data are available for this quadrangle.

NORTH



QUADRANGLE LOCATION

MAYSFIELD, TEXAS
7.5 MINUTE SERIES
SHEET NUMBER 15 OF 26

Joins sheet 16, Culbert

Joins sheet 21,
Gause

Joins sheet 10, Hammond

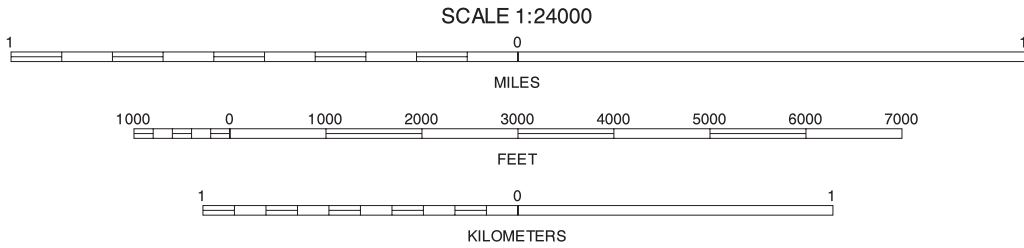
Joins sheet 11,
Overtonville



This soil survey was compiled by the U.S. Department of Agriculture, Natural Resources Conservation Service, formerly Soil Conservation Service. Base maps are orthophotographs prepared by the Natural Resources Conservation Service, from 1995 aerial photography. Hydrography and cultural layers were acquired from the Natural Resources Conservation Service. The hydrography and cultural layers were edited to conform with features represented on the publication orthophotography and to enhance the clarity of the soils information.

North American Datum of 1983 (NAD83). GRS-90 Spheroid 1000 meter ticks: Universal Transverse Mercator, zone 14. Coordinate grid ticks and land division data, if shown, are approximately positioned. Digital data are available for this quadrangle.

NORTH



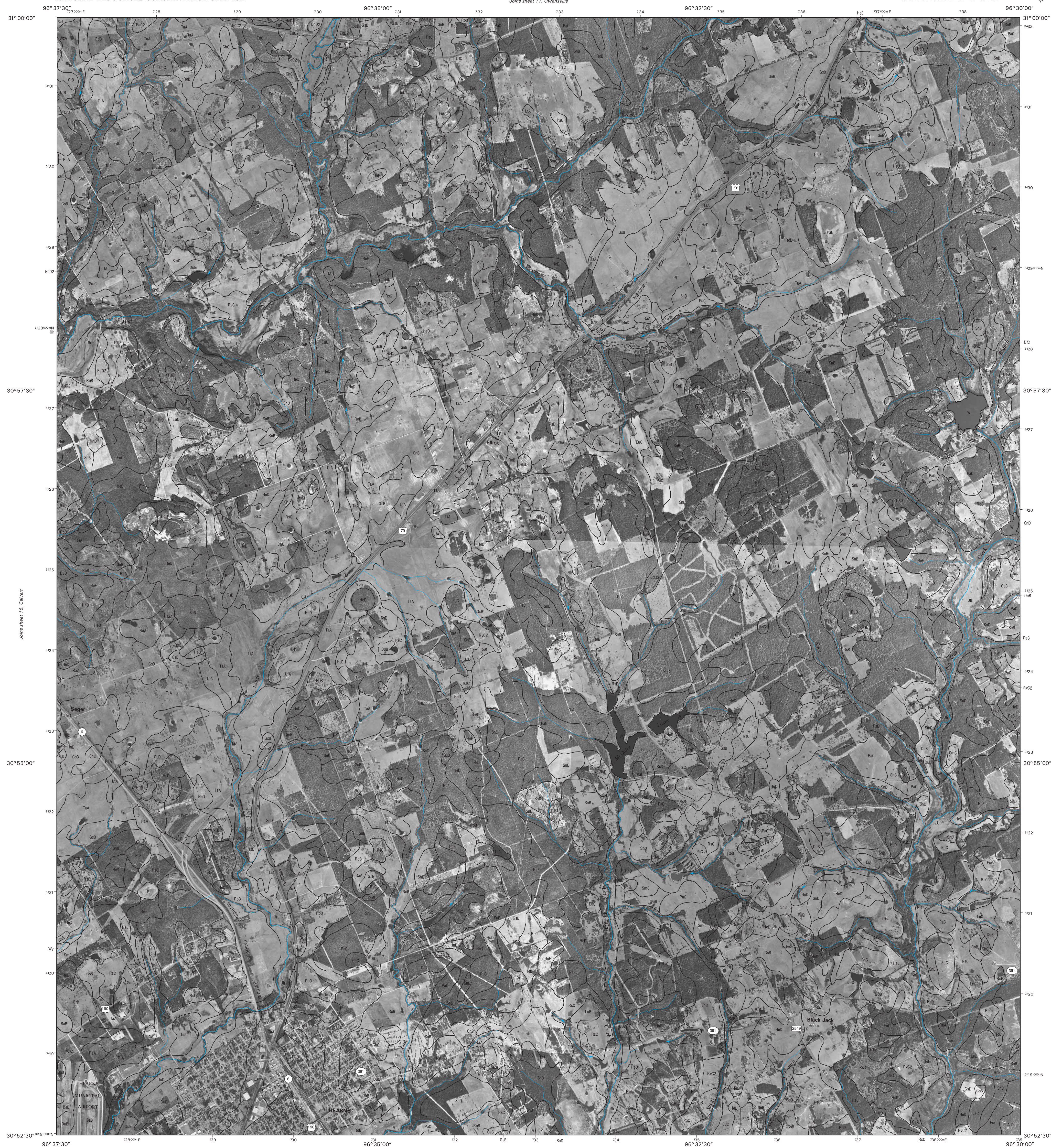
QUADRANGLE LOCATION

CALVERT, TEXAS
7.5 MINUTE SERIES
SHEET NUMBER 16 OF 26

Joins sheet 22,
Heavens South

UNITED STATES
DEPARTMENT OF AGRICULTURE
NATURAL RESOURCES CONSERVATION SERVICE

ROBERTSON COUNTY, TEXAS
HEARNE NORTH QUADRANGLE
SHEET NUMBER 17 OF 26



This soil survey was compiled by the U.S. Department of Agriculture, Natural Resources Conservation Service, formerly Soil Conservation Service. Base maps are orthophotographs prepared by the Natural Resources Conservation Service, from 1995 aerial photography. Hydrography and cultural layers were acquired from the Natural Resources Conservation Service. The hydrography and cultural layers were edited to conform with features represented on the publication orthophotography and to enhance the clarity of the soils information.

North American Datum of 1983 (NAD83). GRS-80 Spheroid 1000 meter tics: Universal Transverse Mercator, zone 14. Coordinate grid ticks and land division data, if shown, are approximately positioned. Digital data are available for this quadrangle.

HEARNE NORTH, TEXAS
7.5 MINUTE SERIES
SHEET NUMBER 17 OF 26



QUADRANGLE LOCATION



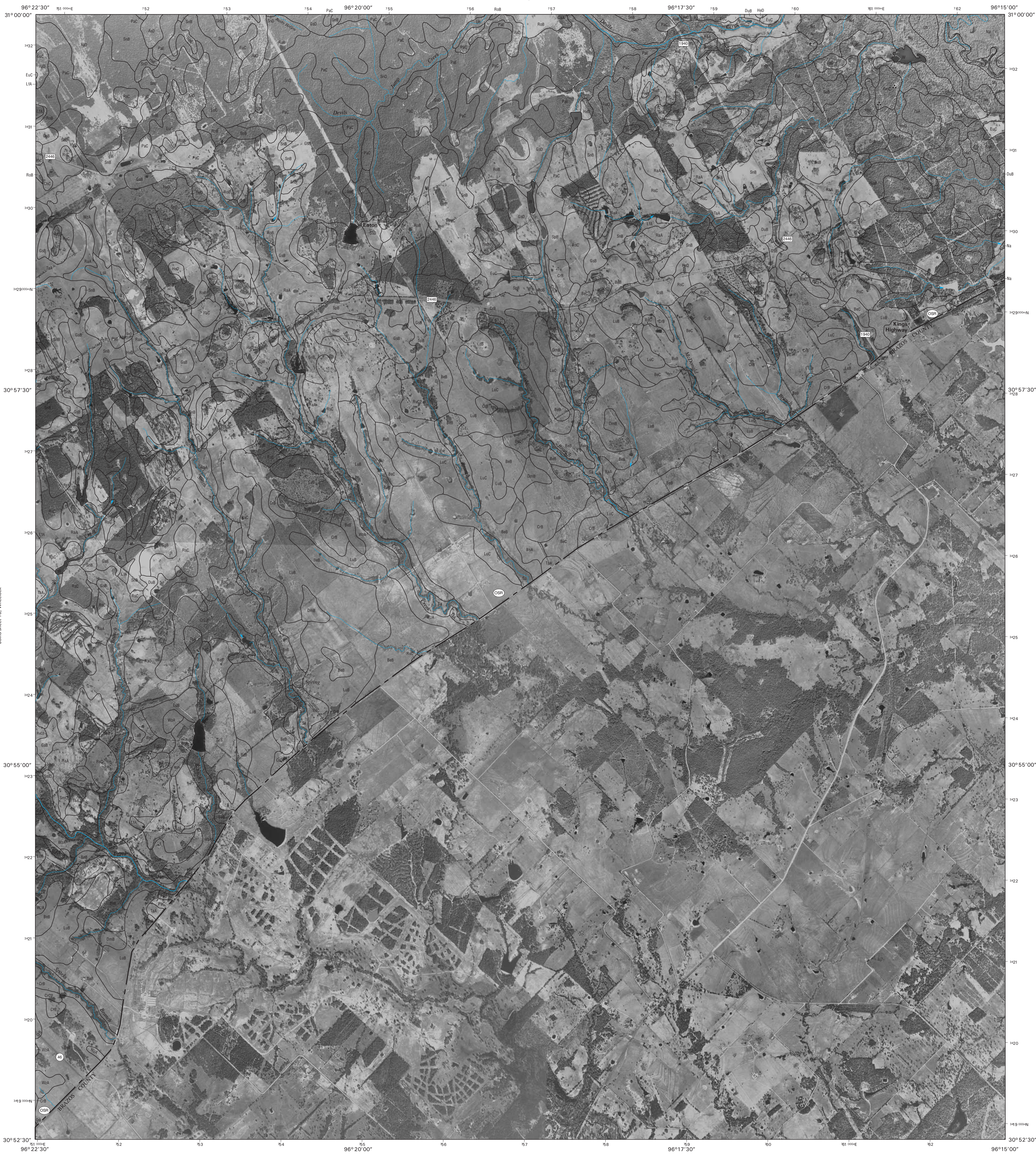
Joins sheet 22,
Hearne South

NORTH



WHELOCK, TEXAS
7.5 MINUTE SERIES
SHEET NUMBER 18 OF 26

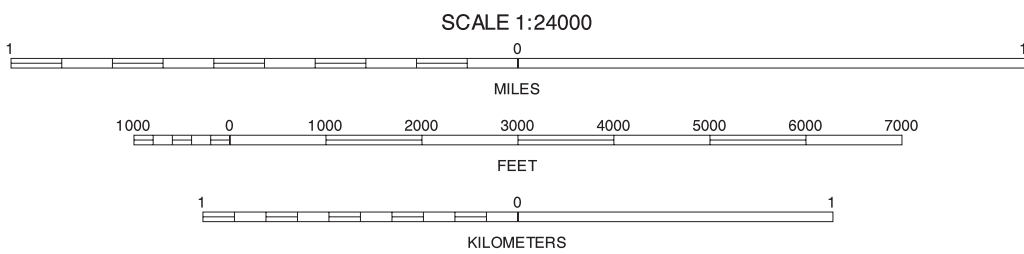
Joins sheet 13, Camp Creek Lake



This soil survey was compiled by the U.S. Department of Agriculture, Natural Resources Conservation Service, formerly Soil Conservation Service. Base maps are orthophotographs prepared by the Natural Resources Conservation Service, from 1995 aerial photography. Hydrography and cultural layers were acquired from the Natural Resources Conservation Service. The hydrography and cultural layers were edited to conform with features represented on the publication orthophotography and to enhance the clarity of the soils information.

North American Datum of 1983 (NAD83). GRS-80 Spheroid 1000 meter ticks: Universal Transverse Mercator, zone 14. Coordinate grid ticks and land division data, if shown, are approximately positioned. Digital data are available for this quadrangle.

NORTH



QUADRANGLE LOCATION

EDGE, TEXAS
7.5 MINUTE SERIES
SHEET NUMBER 19 OF 26

Joins sheet 13
Calf Creek Lake

UNITED STATES
DEPARTMENT OF AGRICULTURE
NATURAL RESOURCES CONSERVATION SERVICE

Joins sheet 14, Hilltop Lakes

ROBERTSON COUNTY, TEXAS
CANARY QUADRANGLE
SHEET NUMBER 20 OF 26

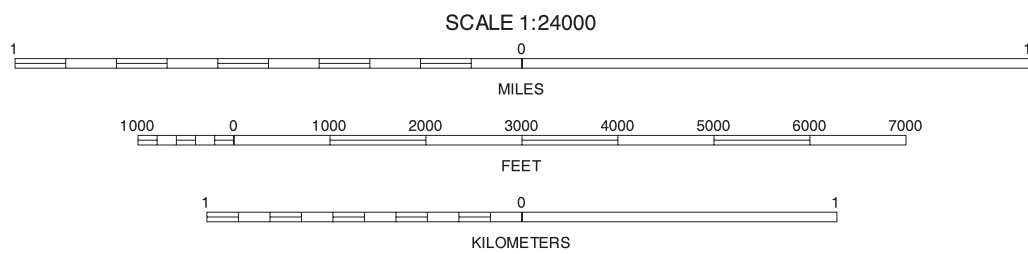


Joins sheet 19, Edge

This soil survey was compiled by the U.S. Department of Agriculture, Natural Resources Conservation Service, formerly Soil Conservation Service. Base maps are orthophotographs prepared by the Natural Resources Conservation Service, from 1995 aerial photography. Hydrography and cultural layers were acquired from the Natural Resources Conservation Service. The hydrography and cultural layers were edited to conform with features represented on the publication orthophotography and to enhance the clarity of the soils information.

North American Datum of 1983 (NAD83). GRS-80 Spheroid 1000 meter ticks: Universal Transverse Mercator, zone 14. Coordinate grid ticks and land division data, if shown, are approximately positioned. Digital data are available for this quadrangle.

NORTH



QUADRANGLE LOCATION

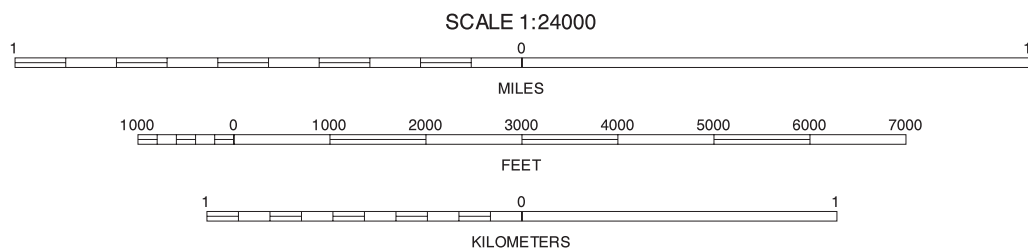
CANARY, TEXAS
7.5 MINUTE SERIES
SHEET NUMBER 20 OF 26



This soil survey was compiled by the U.S. Department of Agriculture, Natural Resources Conservation Service, formerly Soil Conservation Service. Base maps are orthophotographs prepared by the Natural Resources Conservation Service, from 1995 aerial photography. Hydrography and cultural layers were acquired from the Natural Resources Conservation Service. The hydrography and cultural layers were edited to conform with features represented on the publication orthophotography and to enhance the clarity of the soils information.

North American Datum of 1983 (NAD83), GRS-80 Spheroid, 1000 meter ticks: Universal Transverse Mercator, zone 14. Coordinate grid ticks and land division data, if shown, are approximately positioned. Digital data are available for this quadrangle.

NORTH



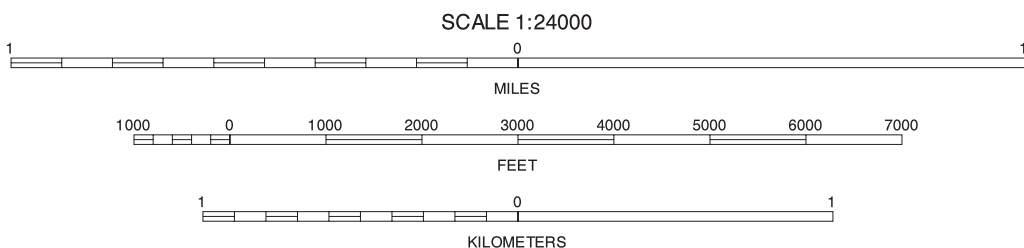
QUADRANGLE LOCATION

GAUSE, TEXAS
7.5 MINUTE SERIES
SHEET NUMBER 21 OF 26

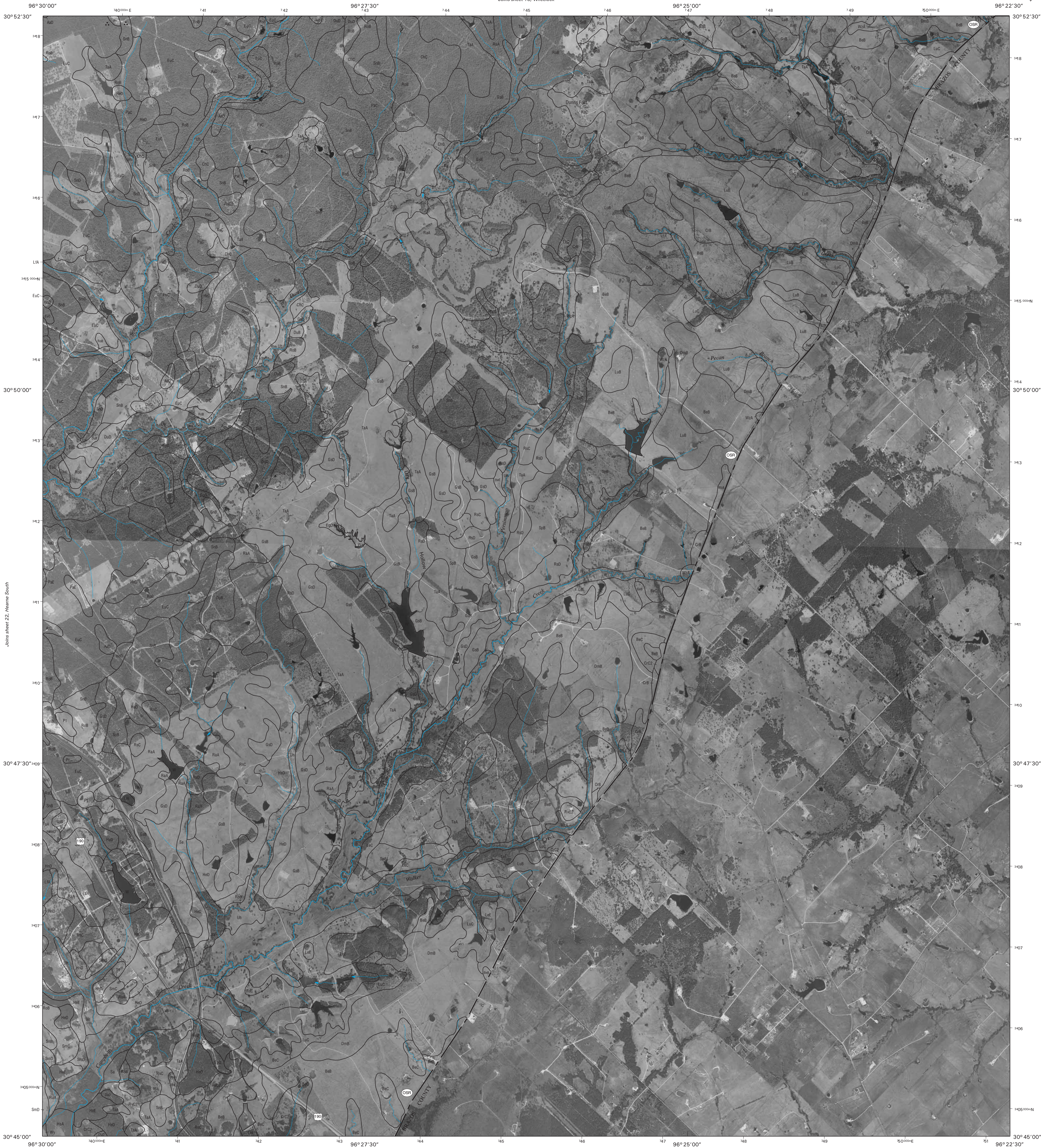


This soil survey was compiled by the U.S. Department of Agriculture, Natural Resources Conservation Service, formerly Soil Conservation Service. Base maps are orthophotographs prepared by the Natural Resources Conservation Service, from 1995 aerial photography. Hydrography and cultural layers were acquired from the Natural Resources Conservation Service. The hydrography and cultural layers were edited to conform with features represented on the publication orthophotography and to enhance the clarity of the soils information.

North American Datum of 1983 (NAD83), GRS-80 Spheroid, 1000 meter ticks: Universal Transverse Mercator, zone 14. Coordinate grid ticks and land division data, if shown, are approximately positioned. Digital data are available for this quadrangle.

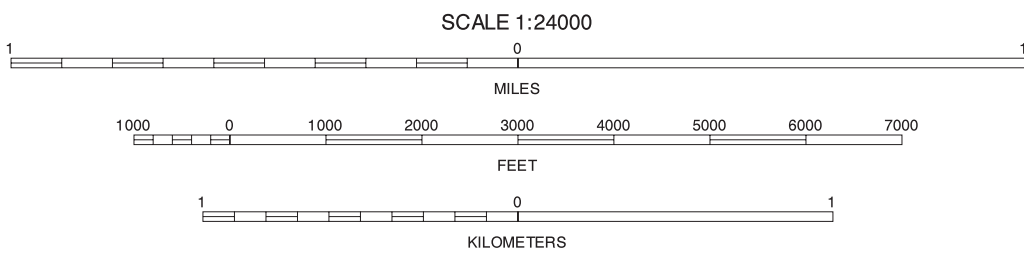


HEARNE SOUTH, TEXAS
7.5 MINUTE SERIES
SHEET NUMBER 22 OF 26



This soil survey was compiled by the U.S. Department of Agriculture, Natural Resources Conservation Service, formerly Soil Conservation Service. Base maps are orthophotographs prepared by the Natural Resources Conservation Service, from 1995 aerial photography. Hydrography and cultural layers were acquired from the Natural Resources Conservation Service. The hydrography and cultural layers were edited to conform with features represented on the publication orthophotography and to enhance the clarity of the soils information.

North American Datum of 1983 (NAD83), GRS-80 Spheroid, 1000 meter ticks: Universal Transverse Mercator, zone 14. Coordinate grid ticks and land division data, if shown, are approximately positioned. Digital data are available for this quadrangle.



QUADRANGLE LOCATION

DUNN CREEK, TEXAS
7.5 MINUTE SERIES
SHEET NUMBER 23 OF 26

Joins sheet 21, Gause

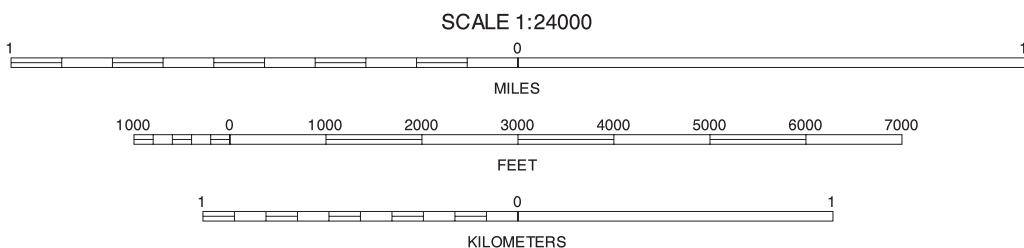
Joins sheet 22,
Harris South



This soil survey was compiled by the U.S. Department of Agriculture, Natural Resources Conservation Service, formerly Soil Conservation Service. Base maps are orthophotographs prepared by the Natural Resources Conservation Service, from 1995 aerial photography. Hydrography and cultural layers were acquired from the Natural Resources Conservation Service. The hydrography and cultural layers were edited to conform with features represented on the publication orthophotography and to enhance the clarity of the soils information.

North American Datum of 1983 (NAD83), GRS-80 Spheroid, 1000 meter ticks; Universal Transverse Mercator, zone 14. Coordinate grid ticks and land division data, if shown, are approximately positioned. Digital data are available for this quadrangle.

NORTH



QUADRANGLE LOCATION

GOODWILL, TEXAS
7.5 MINUTE SERIES
SHEET NUMBER 24 OF 26

Joins sheet 22, Hearne South

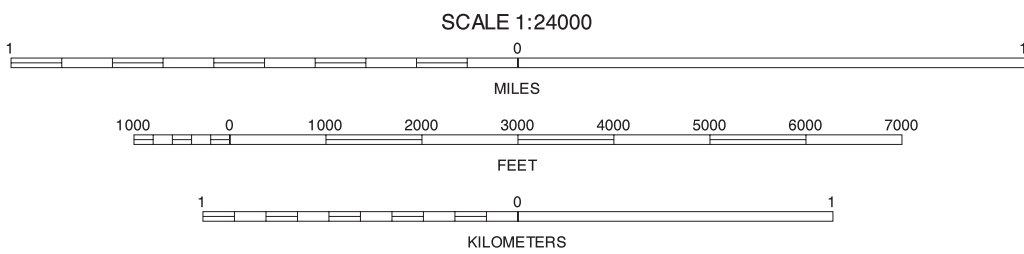
Joins sheet 23,
Quinn Creek



This soil survey was compiled by the U.S. Department of Agriculture, Natural Resources Conservation Service, formerly Soil Conservation Service. Base maps are orthophotographs prepared by the Natural Resources Conservation Service, from 1995 aerial photography. Hydrography and cultural layers were acquired from the Natural Resources Conservation Service. The hydrography and cultural layers were edited to conform with features represented on the publication orthophotography and to enhance the clarity of the soils information.

North American Datum of 1983 (NAD83), GRS-80 Spheroid, 1000 meter ticks; Universal Transverse Mercator, zone 14. Coordinate grid ticks and land division data, if shown, are approximately positioned. Digital data are available for this quadrangle.

NORTH



QUADRANGLE LOCATION

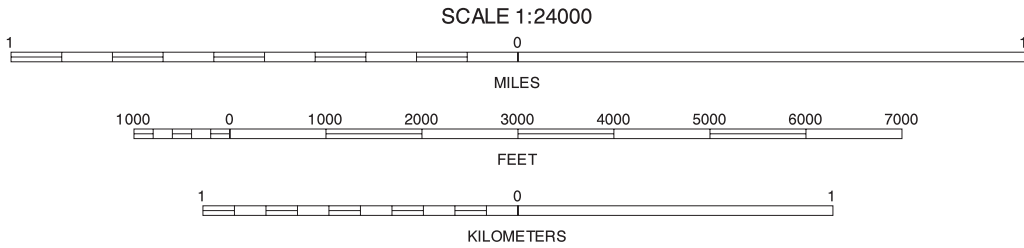
MUMFORD, TEXAS
7.5 MINUTE SERIES
SHEET NUMBER 25 OF 26



This soil survey was compiled by the U.S. Department of Agriculture, Natural Resources Conservation Service, formerly Soil Conservation Service. Base maps are orthophotographs prepared by the Natural Resources Conservation Service, from 1995 aerial photography. Hydrography and cultural layers were acquired from the Natural Resources Conservation Service. The hydrography and cultural layers were edited to conform with features represented on the publication orthophotography and to enhance the clarity of the soils information.

North American Datum of 1983 (NAD83); GRS-80 Spheroid; 1000 meter ticks; Universal Transverse Mercator, zone 14. Coordinate grid ticks and land division data, if shown, are approximately positioned. Digital data are available for this quadrangle.

NORTH



QUADRANGLE LOCATION

BRYAN WEST, TEXAS
7.5 MINUTE SERIES
SHEET NUMBER 26 OF 26